Vol. 1080 Number 3

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Route to:

PATENTS

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U.S.
DEPARTMENT
OF COMMERCE

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July 21, 1987 Volume 1080 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1080 OG 28
Notice of Maintenance Fees Payable	1080 OG 28
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1080 OG 29
Reissue Applications Filed	1080 OG 29
Requests for Reexaminations Filed	1080 OG 30
Removal from Register	1080 OG 30
Board of Patent Appeals and Interference Vacancies	1080 OG 35
Patent Certificates of Correction	1080 OG 37
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1080 OG 38
Condition of Patent Applications	1080 OG 39
Reexaminations	1129
Reissue Patents Granted (32,460)	1131
Patents Granted	
General and Mechanical (4,680,812)	1133
Chemical (4,681,591)	1409
Electrical (4,681,981)	1521
Design Patents Granted (290,900)	1657
Index of Patentees	PI 1
Indices of Reissue, Reexamination, and Design Patentees	PI 58
Classification of	
Patents (Including Reissues and Reexaminations)	PI 63
Designs	PI 66
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 67
Designs	PI 68
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
June 2, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 17, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,459,703 through 4,461,042
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 3, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,381,568	06/331,041	5/3/83
4,381,572	06/219,232	5/3/83
4,381,573	06/279,882	5/3/83
4,381,588	06/226,206	5/3/83
4,381,589	06/225,901	5/3/83
4,381,607	06/263,105	5/3/83
4,381,616	06/301,386	5/3/83
4,381,617	06/220,943	5/3/83
4,381,618	06/226,065	5/3/83
4,381,645	06/222,635	5/3/83
4,381,653	06/245,843	5/3/83
4,381,667	06/258,749	5/3/83
4,381,671	06/247,883	5/3/83
4,381,685	06/352,996	5/3/83
4,381,686	06/265,423	5/3/83
4,381,688	06/296,465	5/3/83
4,381,690	06/239,449	5/3/83
4,381,712	06/252,738	5/3/83
4,381,725	06/250,584	5/3/83
4,381,726	06/322,293	5/3/83
4,381,731	06/290,715	5/3/83
4,381,739	06/269,268	5/3/83
4,381,754	06/302,211	5/3/83
4,381,758	06/285,386	5/3/83
4,381,761	06/257,206	5/3/83
4,381,768	06/264,689	5/3/83
4,381,769	06/294,973	5/3/83
4,381,776	06/254,078	5/3/83
4,381,777	06/225,181	5/3/83
4,381,778	06/267,679	5/3/83
4,381,779	06/284,055	5/3/83
4,381,788	06/238,813	5/3/83
4,381,795	06/239,234	5/3/83
4,381,834	06/265,664	5/3/83
4,381,839	06/239,318	5/3/83
4,381,850	06/312,339	5/3/83
4,381,891	06/280,691	5/3/83
4,381,906	06/309,566	5/3/83
4,381,908	06/240,708	5/3/83
4,381,917	06/348,602	5/3/83
4,381,955	06/255,081	5/3/83
4,381,982	06/367,151	5/3/83
4,381,985	06/242,312	5/3/83
4,381,988	06/285,060	5/3/83
4,381,989	06/322,771	5/3/83
4,381,996	06/326,727	5/3/83
4,381,997	06/320,374	5/3/83
4,382,000	06/352,724	5/3/83
4,382,044	06/275,259	5/3/83
4,382,073	06/224,918	5/3/83
4,382,087	06/259,791	5/3/83
4,382,088	06/295,180	5/3/83
4,382,094	06/288,178	5/3/83
4,382,096	06/286,671	5/3/83
4,382,098	06/404,276	5/3/83
4,382,107	06/265,949	5/3/83
4,382,127	06/299,210	5/3/83
4,382,133	06/260,438	5/3/83
4,382,134	06/313,732	5/3/83
4,382,156	06/249,642	5/3/83
4,382,159	06/268,364	5/3/83
4,382,161	06/228,397	5/3/83
4,382,176	06/249,590	5/3/83
4,382,186	06/224,313	5/3/83
4,382,189	06/262,051	5/3/83
4,382,190	06/226,026	5/3/83
4,382,191	06/267,803	5/3/83
4,382,193	06/242,973	5/3/83
4,382,201	06/258,226	5/3/83
4,382,220	06/284,989	5/3/83
4,382,235	06/224,260	5/3/83
4,382,255	06/311,154	5/3/83
4,382,273	06/264,287	5/3/83
4,382,280	06/221,487	5/3/83
4,382,292	06/251,571	5/3/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,518,686, Re. S.N. 055,726, Filed May 21, 1987, Cl. 430/512, COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING UV FILTER COMPOUNDS, Masao Sasaki, et al., Owner of Record:

Konishiroku Photo Industry Co., Ltd., Tokyo, Japan, Attorney or Agent: Jerry P. Voight, Ex. Gp.: 156

4,519,665, Re. S.N. 056,937, Filed May 27, 1987, Cl. 439/608, SOLDERLESS MOUNTED FILTERED CONNECTOR, Richie M. Althouse, Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 322

4,526,738, Re. S.N. 057,944, Filed June 4, 1987, Cl. 264/176F, POLYESTER FIBER AND METHOD FOR THE PRODUCTION THEREOF, Takehiko Miyoshi, et al., Owner of Record: *Toray Industries, Inc., Tokyo, Japan,* Attorney or Agent: Austin R. Miller, et al., Ex. Gp.: 137

4,554,973, Re. S.N. 053,985, Filed May 26, 1987, Cl. 166/192, APPARATUS FOR SEALING A WELL CASING, Clinton O. Shonrock, et al., Owner of Record: *Schlumberger Technology, Houston, Tex.,* Attorney or Agent: E. R. Archambeau, Jr., et al., Ex. Gp.: 356

4,568,230, Re. S.N. 054,549, Filed May 27, 1987, Cl. 413/66, TWO-OUT BELT SYSTEM, Omar L. Brown, Owner of Record: *Dayton Reliable Tool & Mfg. Co., Dayton, Ohio,* Attorney or Agent: Joseph G. Nauman, et al., Ex. Gp.: 323

4,576,582, Re. S.N. 053,152, Filed May 21, 1987, Cl. 446/16, TOY BUBBLE BLOWING LAWN MOWER, James S. Panzarella, Owner of Record: *Quaker Oats Co., Chicago, Ill.,* Attorney or Agent: George W. Shaw, et al., Ex. Gp.: 331

4,577,572, Re. S.N. 054,395, Filed May 26, 1987, Cl. 112/231, FULLY ROTATING HOOK FOR A LOCK STITCH SEWING MACHINE, Tokuzo Hirose, Owner of Record: *Hirose Manufacturing Co., Osaka, Japan,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 247

4,577,608, Re. S.N. 056,862, Filed June 1, 1987, Cl. 123/583, CARBURETOR SYSTEM INCLUDING AN ADJUSTABLE THROTTLE LINKAGE, Chester G. Du Bois, et al., Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 342

4,617,733, Re. S.N. 053,250, Filed May 22, 1987, Cl. 29/874, PROCESS OF MANUFACTURING A FLEXIBLE SUBSTRATE ASSEMBLY, Thor Olson, Owner of Record: *Molex, Inc., Lisle, Ill.,* Attorney or Agent: Louis A. Hecht, Ex. Gp.: 326

4,644,425, Re. S.N. 055,118, Filed May 28, 1987, Cl. 360/69, CONTROL APPARATUS FOR CONTROLLING, Isao Tamaki, Owner of Record: *Sony Corp., Tokyo, Japan,* Attorney or Agent: Lewis H. Eslinger, et al., Ex. Gp.: 235

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 18, 1986, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

CAMERON WEIFFENBACH,
May 14, 1987. *Director, Office of Enrollment & Discipline.*

A

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Dziurgot, Robert F., 159 W. 53rd St., New York, N.Y. 10019

Patent and Trademark Office
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO-87-A6-chemical technology, PTO-87-A7-electrical technology, and PTO-87-A8-mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the

Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF-171;
(2) Merit Program Interest Statement, CD-261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD-362 (letters of reference for outside candidates);
(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

Feb. 3, 1987.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner or Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of July 21, 1987

D. 285,688	4,621,122	4,642,654	4,650,594
4,352,877	4,622,821	4,642,754	4,650,901
4,395,414	4,626,067	4,642,799	4,650,984
4,472,429	4,626,333	4,642,883	4,651,299
4,484,307	4,627,855	4,643,174	4,651,301
4,521,936	4,628,269	4,643,182	4,651,845
4,522,548	4,629,096	4,643,209	4,651,943
4,530,672	4,629,149	4,643,300	4,652,210
4,539,900	4,629,919	4,643,433	4,652,674
4,550,096	4,629,956	4,643,546	4,652,946
4,562,233	4,630,569	4,643,591	4,653,639
4,564,665	4,631,559	4,643,963	4,653,985
4,564,842	4,631,734	4,644,287	4,654,380
4,567,990	4,632,877	4,644,403	4,654,617
4,572,869	4,633,108	4,644,701	4,654,735
4,576,262	4,633,194	4,644,936	4,655,129
4,577,343	4,633,319	4,645,197	4,655,269
4,584,942	4,633,690	4,645,288	4,655,515
4,590,595	4,633,966	4,645,982	4,655,835
4,592,554	4,634,071	4,646,105	4,655,903
4,593,394	4,634,196	4,646,234	4,655,955
4,595,067	4,635,854	4,646,247	4,656,018
4,600,067	4,636,785	4,646,614	4,656,239
4,600,723	4,636,787	4,647,233	4,656,379
4,602,375	4,636,821	4,647,323	4,657,424
4,604,142	4,637,228	4,647,456	4,658,016
4,606,002	4,637,437	4,647,571	4,658,762
4,607,044	4,637,988	4,647,581	4,659,220
4,607,891	4,639,444	4,647,628	4,659,231
4,608,336	4,639,922	4,649,176	4,660,344
4,608,379	4,641,240	4,649,449	4,660,622
4,608,412	4,641,258	4,649,529	4,660,787
4,609,264	4,641,436	4,649,766	4,661,321
4,610,730	4,641,708	4,649,851	4,661,736
4,619,319	4,642,360	4,640,435	
4,619,325	4,642,441	4,650,513	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 20, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-18-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-13-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-10-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-25-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-29-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during June 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,514,784 to 3,518,700, inclusive

Plant Patents ..... Numbers 2,970 to 2,976 inclusive

REEXAMINATIONS

JULY 21, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

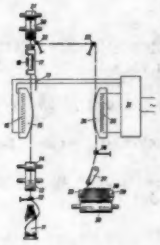
B1 3,472,011 (729th)

TREATMENT OF ARTIFICIAL YARNS AND THREADS

Ernest P. R. Scragg, Sutton Grange, England, assignor to Lex Tex Ltd., Fort Lauderdale, Fla.

Reexamination Request No. 90/000,069, Sep. 9, 1981.
Reexamination Certificate for Patent No. 3,472,011, issued Oct. 14, 1969, Ser. No. 552,342, May 23, 1966.
Continuation of Ser. No. 317,396, Oct. 2, 1963, abandoned, Continuation-in-part of Ser. No. 747,162, Jul. 8, 1958, abandoned.
Claims priority, application United Kingdom, Jul. 11, 1957, 21962/57

Int. Cl.[4] D02G *1/02*; D01H *13/28*
U.S. Cl. 57—290



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-29 are now disclaimed.

[1. A continuous process for producing a partially relaxed crimped thermoplastic synthetic yarn, comprising the steps of heating the yarn after it leaves a package, to an extent sufficient to soften the yarn; imparting a high degree of twist to the yarn while hot and soft; fixing the twist in the yarn by cooling the latter; untwisting the yarn in an untwisting zone to thereby produce a semifinished crimped yarn capable of undergoing a predetermined maximum amount of contraction and tending to contract to such maximum amount; withdrawing said semifinished crimped yarn from said untwisting zone and advancing it into a reheating zone at a predetermined speed; withdrawing the yarn from said reheating zone at a speed smaller than said predetermined speed at which said semifinished crimped yarn is advanced into said reheating zone without any tensioning of said yarn between said advancing of said semifinished crimped yarn into said reheating zone and withdrawing of said yarn from said reheating zone, so as to permit said semifinished crimped yarn to partially contract upon entering said reheating zone to a predetermined degree substantially smaller than said predetermined maximum amount and solely determined by the difference in the speeds at which it is advanced into and withdrawn from said reheating zone and to pass through said reheating zone in its thus partially contracted state; reheating in said reheating zone said semifinished crimped yarn in its partially contracted state to an extent only sufficient to partly relax the crimp of said semifinished crimped yarn while the latter is in said partially contracted state thereof and sufficient to fix the relaxation of said partially relaxed crimped yarn but without affecting the extent of partial contraction of said semifinished partially relaxed crimped yarn; and cooling said yarn so as to stabilize it in its partially contracted state with its crimp partly relaxed to obtain a finished only partially contracted yarn whose crimp is partly relaxed.]

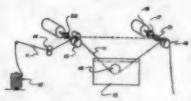
B1 3,762,220 (730th)

CONTINUOUS EVALUATION OF YARN CRIMP

James A. Gusack, Williamsburg, Va.; Bernard B. Stephens, Anderson, S.C. and James A. Stevens, Williamsburg, Va., assignors to Don Badische Company, Williamsburg, Va.

Reexamination Request No. 90/000,716, Jan. 24, 1985.
Reexamination Certificate for Patent No. 3,762,220, issued Oct. 2, 1973, Ser. No. 216,835, Jan. 10, 1972.

Int. Cl.[4] G01D *21/00*
U.S. Cl. 73—160



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2-4 are cancelled.

Claim 1 is determined to be patentable as amended.

New claims 5-7 are added and determined to be patentable.

1. A continuous process for evaluation of the crimp along the length of a yarn, which process comprises the following sequential steps:

a. [Causing] *causing* the yarn to travel at a velocity ω_1 under a constant tension sufficient to straighten but not substantially stretch the yarn, and continuously measuring velocity ω_1;

b. [Subjecting] *subjecting* the traveling yarn, at a point downstream of the application of the first constant tension, to a second constant tension which is small enough to allow any crimp in the yarn to be reformed;

c. [Continuously] *continuously* measuring the velocity ω_2 of the yarn as it travels past the point of application of the second constant tension; and

d. [Continuously] *continuously* evaluating the crimp along the length of the yarn by means of the relationship

$$\text{Crimp } \% = ((\omega_1 - \omega_2)/\omega_1)100$$

[.], *wherein the yarn is subjected to an environment which affords the development of any latent crimp in the yarn in step b.*

B1 4,142,436 (731st)

METHOD OF PLAYING STRINGED MUSICAL INSTRUMENT

Emmett H. Chapman, 8320 Yucca Trail, Los Angeles, Calif. 90046

Reexamination Request No. 90/000,469, Nov. 18, 1983.
Reexamination Certificate for Patent No. 4,142,436, issued Mar. 6, 1979, Ser. No. 746,027, Nov. 30, 1976.
Continuation of Ser. No. 552,080, Feb. 28, 1975, abandoned, which is a division of Ser. No. 457,396, Apr. 3, 1974, Pat. No. 3,868,880, which is a division of Ser. No. 334,859, Feb. 22, 1973, Pat. No. 3,833,751.
Int. Cl.[4] G10D *3/06*; G10H *3/18*
U.S. Cl. 84—1.16

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–4 are cancelled.

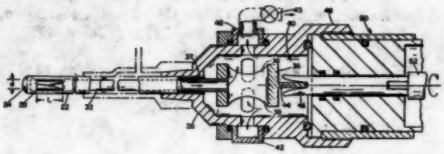
[1. A method of playing by a performer a musical instrument of a type comprising a fretted fingerboard with fixed frets, a plurality of tensioned strings extending in adjacent spaced relation to the fretted fingerboard, and string tensioning means, said method being the playing of the said instrument by a performer substantially exclusively by engaging the strings directly by the fingers, the engaging being by tapping by fingers of both hands substantially simultaneously the said strings and holding said strings against selected frets by fingers of both hands.]

B1 4,203,444 (732nd)

SURGICAL INSTRUMENT SUITABLE FOR CLOSED SURGERY SUCH AS OF THE KNEE

Leonard J. Bonnell, Medford; Edward H. McHugh, Southboro; Douglas D. Sjostrom, Wakefield, all of Mass., and Lanny L. Johnson, Okemos, Mich., assignors to Dyonics, Inc., Woburn, Mass.

Reexamination Request No. 90/000,650, Oct. 18, 1984.
Reexamination Certificate for Patent No. 4,203,444, issued May 20, 1980, Ser. No. 848,982, Nov. 7, 1977.
Int. Cl.[4] A61M *1/00*; A61B *17/32*
U.S. Cl. 604—22



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **24–55** is confirmed.

Claims **1** and **2** are determined to be patentable as amended.

Claims **3–23**, dependent on an amended claim, are determined to be patentable.

New claims **56–59** are added and determined to be patentable.

1. A surgical instrument for a joint space of the body *capable of performing intra-articular closed surgery through a puncture wound, such as an operation of the knee, by arthroscopy,* characterized in that the instrument comprises an intra-articular shaver comprising an external stationary tube sized *and constructed* for insertion into said joint space *through a puncture opening in the flesh of the body,* said external tube having a closed distal end and defining a side-facing, axially extending shaving port on the periphery only of said external tube and an internal member with close running fit with said external tube, defining an internal, rotary blade at said shaving port, said blade during each cycle constructed to open said port to the interior of the instrument and said blade having an axially extending edge adapted to co-act in shearing action with a cooperative axial edge defined by said external tube at said port to produce a succession of discrete shavings with progressive revolutions of said blade, said internal member having radial bearing portions at both proximal and distal ends of said blade, rotatably supported by corresponding portions of said external tube and effective to maintain said blade and edge in shearing relation, a vacuum conduit for drawing fluid and articles to be shaved into said shaving port and to draw said discrete shavings through the instrument, and a drive motor adapted to rotate said blade at a shearing speed of the order of 200 rpm or below that enables degenerated cartilage and synovial tissue of the joint to enter and be severed by said blade into discrete shavings for being transported away in succession through said vacuum conduit.

REISSUES

JULY 21, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,460

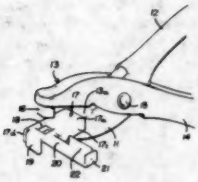
DISKETTE PUNCH WITH ATTACHED GAGE

Archie L. Leggett, Jr., Lauderhill, Fla., assignor to R & L Enterprises, Inc., Philadelphia, Pa.

Original No. 4,488,358, dated Dec. 18, 1984, Ser. No. 490,330, May 2, 1983. Application for reissue Jun. 3, 1985, Ser. No. 740,396

Int. Cl.[4] B26F *1/32*

U.S. Cl. 30—363 4 Claims



1. In a punch for use on a magnetic record diskette jacket which has substantially flat opposite major faces and adjoining first and second straight edges extending between said faces perpendicular to each other, said punch having:

opposed first and second jaws which are movable toward and away from each other;

and a punch element on said first jaw projecting toward said second jaw;

the improvement which comprises a gage attached to said second jaw and presenting:

a flat wall formed with an opening positioned to receive said punch element when said first and second jaws are brought together;

a flat extension coplanar with said flat wall and located on one side of said jaws, said extension being elongated away from said opening to engage one of said faces of the diskette jacket along said first edge of the jacket;

a side lip joined to said extension and extending perpendicular to the plate of said extension *and in lateral alignment with said opening* along the direction of elongation of said extension to engage said first edge of the diskette jacket when said extension engages said one face of the diskette jacket;

an end lip joined to said extension away from said opening past said side lip and extending perpendicular to the plate of said extension perpendicular to the direction of elongation of said extension to engage said second edge of the diskette jacket when said side lip engages said first edge of the diskette jacket;

said side lip and said end lip when in engagement respectively with said first and second edges of the diskette jacket positioning said opening in the gage *intersecting and* extending inward from said first edge of the diskette jacket, whereby said punch element forms a notch in the diskette jacket extending inward from said first edge thereof when the jaws of the punch are brought together.

Re. 32,461

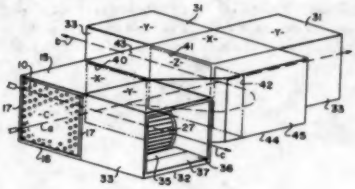
MODULAR DRY-AIR EVAPORATIVE COOLER

Leonard J. Di Perl, 18325 Lahey St., Northridge, Calif. 91326

Original No. 3,877,244, dated Apr. 15, 1975, Ser. No. 368,756, Jun. 11, 1973. Continuation of Ser. No. 183,107, Sep. 2, 1980, abandoned. Application for reissue Dec. 15, 1982, Ser. No. 472,225

Int. Cl.[4] F28D *5/00*

U.S. Cl. 62—314 20 Claims



1. A *rectangular* dry-air evaporative cooler [including] *module consisting essentially of:* a pair *only* of [spaced] *imperforate planar* side members [and a] *spaced by* ep core means *with a pair of opposite open sides thereof extending coextensively between said side members for angularly related movement of two separate columns of air, and with opposed end headers mounted to said side members perpendicular thereto, the core means* having opposite interfaces separating the spaces between said *side* ep members into two angularly related air passages with wetting means at one interface engaging a primary evaporative column of air and with the other interface engaging a secondary sensible cooled column of air with heat transfer between said opposite interfaces, [the remaining two pairs of opposite sides between said members being open therebetween for said angularly related movement of said separate columns of air, and both said separate columns of air being movable through said two angularly related passages coextensively between the spaced side members] *wherein the core means is comprised of a multiplicity of spaced parallel rigid and self-supporting tubes of plastic material mounted at their respective ends in said end headers and defining one of said angularly related air passages through the tubes and through the opposite end headers, said end headers extending coextensively between and spacing the side members at one pair of opposite sides of the core means, said end headers and side members defining the other one of said angularly related air passages over the tubes, said cooler module comprising means including said spaced, parallel, and self-supporting tubes of plastic material for obtaining substantially the same temperature decrease as a dry-air evaporative cooler module that is other wise the same in size, shape and operation as said rectangular dry-air evaporative cooler module and including metal tubes having substantially the same length, rigidity, spacing between them, air flow through them, air flow over them, and water flow over them, as said rectangular dry-air evaporative cooler module.*

Re. 32,462

CENTRIFUGAL FLUID MACHINE

Yoichi Yoshinaga, Minorimachi; Shinjiro Ueda, Kashiwa, and Hideo Nishida, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,395,197, dated Jul. 26, 1983, Ser. No. 171,268, Jul. 22, 1980. Application for reissue Jul. 26, 1985, Ser. No. 759,440

Claims priority, application Japan, Aug. 1, 1979, 54-97273

Int. Cl.[4] F04D *29/44, 29/68*

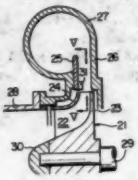
U.S. Cl. 415—211 11 Claims

5. A centrifugal fluid machine comprising:

an impeller having a shroud, a hub and a plurality of blades extending between said shroud and said hub, said shroud and said hub having their respective adjacent radially outer edges cooperating with each other to define therebetween an outlet;

a vaneless diffuser located around the outlet of said impeller and including a pair of opposed, but spaced first and second annular diffuser plates respectively located adjacent to said shroud and said hub, said first and second diffuser plates having respective inner surfaces which cooperate with each other to define therebetween a diffuser channel, said diffuser channel having an inlet continuous to the outlet of said impeller and an outlet radially remote therefrom, and

a plurality of guide vanes, provided in a circular array on the inner surface of at least one of said first and second diffuser plates, for rectifying distorted flow from the outlet of said impeller, said guide vanes extending in said diffuser channel from close to the outlet of the impeller toward the outlet of



said diffuser channel, said guide vanes extending from the inner surface of said at least one diffuser plate toward the other diffuser plate to a location substantially equal to the value of the small flow angles widthwise of the inlet of said diffuser channel.

PATENTS

GRANTED JUL. 21, 1987

ERRATA

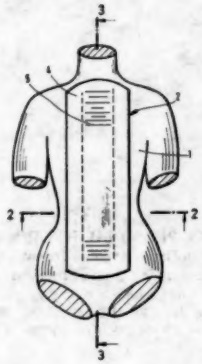
For CLASS	See PATENT NO.
450-134	4,681,113
453-006	4,681,128
181-229	4,681,188
229-052	4,681,252
269-139	4,681,305
439-092	4,681,382
439-135	4,681,383
439-137	4,681,384
439-252	4,681,385
439-347	4,681,386
439-347	4,681,387
439-449	4,681,388
439-557	4,681,389
439-578	4,681,390
439-444	4,681,391
439-751	4,681,392
439-851	4,681,393
536-053	4,681,856
252-091	4,681,914
544-370	4,681,947
379-104	4,682,169
364-523	4,682,189
503-200	4,682,191
503-200	4,682,192
503-209	4,682,193
503-215	4,682,194

PATENTS

GRANTED JULY 21, 1987

GENERAL AND MECHANICAL

4,680,812
ARMOR FOR PROTECTING BODY REGIONS
Adolf Weigl, Tegelweg 129, 2000 Hamburg 72, Fed. Rep. of Germany
Filed Jul. 25, 1986, Ser. No. 889,511
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527691; Sep. 21, 1985, 3533816
Int. Cl.[4] A41D *13/00*; F41H *1/02*
U.S. Cl. 2—2 **19 Claims**



1. A body armor structure for protecting the spinal column of a human body comprising

a plurality of plates each having a width, in use, in a direction generally parallel with the adjacent surface of the body which is substantially greater than the lateral width of the spinal column; and means for interconnecting said plates in a scale-like, elongated array extending generally perpendicular to the width dimensions of said plates with adjacent ones of said plates being interconnected in an overlapping relationship such that at least the central portion of one edge of each plate lies outwardly of the adjacent edge of the next plate relative to said spinal column thereby forming a plurality of serial connections, each said means for interconnecting including

hinge means pivotally connecting said central portion of said one edge to said adjacent edge of the next plate such that said plates are relatively pivotable about an axis which is generally perpendicular to the surfaces of said plates.

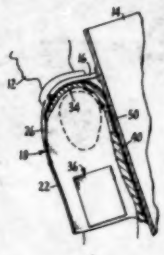
4,680,813
BODY PROTECTIVE GARMENT
Robert B. Glaeser, 108 "C" St., Martinez, Calif. 94553
Filed Mar. 12, 1985, Ser. No. 711,039
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **3 Claims**

1. A protective garment for workers in the rigid load contact occupations, comprising:

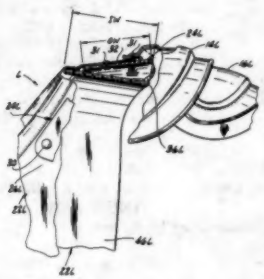
a garment adapted to embrace the torso of such a worker when worn by that worker;

protective pad means adapted to confront the upper and rear surfaces of at least one shoulder of said worker and a substantial part of the rear surface of said worker's torso; and

woven fastener means for removably fastening said protective pad means to the parts of said garment which confront said surfaces when said garment is worn by said worker.



4,680,814
SHOULDER PAD SPRING ARCH SYSTEM
Hal D. Mitchell, and Donald R. Walker, both of Rolla, Mo., assignors to Figgie International Inc., Willoughby, Ohio
Filed Aug. 29, 1986, Ser. No. 901,727
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **14 Claims**



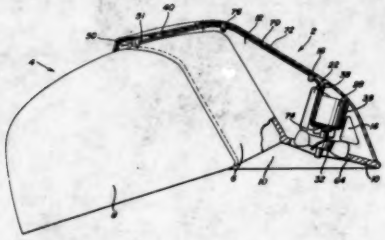
1. A spring arch system for a shoulder pad, such as a football shoulder pad, the spring arch system having an inner arch and an outer arch, the inner and outer arches being of generally inverted U-shape as viewed from the side, and the outer arch extending substantially over the inner arch from a forward portion of the inner arch to a rearward portion of the inner arch with the spacing such that the arches form a generally wedge-shaped configuration at least in the area of the top of the inverted U-shape such that impact on the outer arch causes deformation thereof relative to the inner arch so as to absorb some of the energy of the impact through such relative deformation.

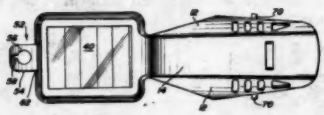
4,680,815

SOLAR POWERED HEADWEAR FAN

Gerald B. Hirsch; Stanley Volk; William Cirrito, and Dale Brann, all of Tucson, Ariz., assignors to Solarcraft, Inc., Tucson, Ariz.

Filed Feb. 4, 1986, Ser. No. 825,897
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—171.3 **22 Claims**





1. A fan assembly comprising:

a housing adapted for resting on an exterior surface of headwear,

fan means mounted in said housing at one end of said housing and adapted for forcing air through an opening defined in a forward protuberance of the headwear,

solar cell means mounted on said housing at another end of said housing opposite to and remote from said one end for powering said fan means and adapted for resting on a crown of the headwear,

vent means defined by said housing for allowing air to be sucked into said housing and forced out of said housing when said power means drive said fan means,

mounting means defined by said housing including hinge means for removably mounting said modular fan assembly on an exterior surface of the headwear,

a portion of said housing occupies a substantial distance between said fan means and said solar cell means, and

display means defined by said portion of said housing between said power means and said fan means for displaying of decorative graphic material.

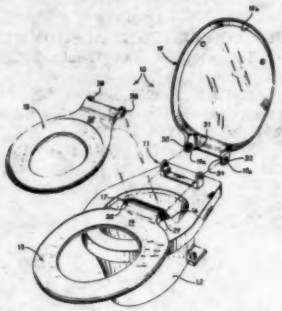
4,680,816

MULTIPLE-RING TOILET SEAT ASSEMBLY AND MOUNTING MEANS

Louie V. Colombani, 49 W. Lincoln Ave., Unit A, Woodland, Calif. 95695

Continuation of Ser. No. 651,882, Sep. 19, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,805
Int. Cl.[4] A47K *13/12*
U.S. Cl. 4—240 **3 Claims**

2. In a toilet seat assembly having a seat portion formed to include a rearwardly extending elongate mounting portion disposed transversely thereof and having a hollow body and cylindrical end bosses disposed to protrude laterally from said hollow body, hinge pins housed in said hollow body and extending from said body coaxially of said end bosses, a mounting bracket formed and adapted to be secured to the top rear surface of a toilet bowl, said bracket including a pair of spaced apart upstanding support pillars, said pillars each including an opening therein, arcuate support shoulders formed on the confronting faces of said pillars and disposed to support said end bosses from beneath to form a pivot independently of said pins to support the rear of said seat portion thereon, and means for readily releasably coupling said mounting portion to said



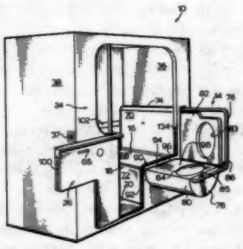
pillars to permit said seat portion to be readily removed from said pillars.

4,680,817

COMPACT PERSONAL HYGIENE CENTER

George C. Sloan, 28 Dixon Avenue, Toronto, Ontario M4L 1N3, and David J. Laine, 1868 Queen Street East, Toronto, Ontario M4L 1H2, both of Canada

Filed Jun. 30, 1986, Ser. No. 880,145
Int. Cl.[4] A47K *4/00*; E03C *1/01*
U.S. Cl. 4—663 **12 Claims**



1. A personal hygiene centre comprising in combination a compact arrangement of a bathtub and a toilet, said bathtub comprising a tub having a door entrance through a front wall of said tub, a seat having a back rest extending across said tub and abutting said front wall, said door entrance comprising an opening in said front wall providing unimpeded access to within said tub and onto said seat, a cavity being defined beneath said seat, means for mounting said toilet for movement into and out of a storage position within said cavity, said toilet comprising a toilet bowl and a toilet seat, means for mounting said toilet seat for movement from a raised position to a lowered position on said toilet bowl, said cavity being defined behind said back rest in addition to being defined beneath said seat, said toilet bowl being connected to said mounting means for movement with said toilet seat in said raised position into and out of a storage position within said cavity beneath said seat and behind said back rest, said mounting means being a track system to which said toilet bowl is secured, said tub having a framework to which said track system is connected, said track system providing cantilever support for said toilet in said extended use position, said door opening defining a front wall edge portion which follows generally an outline of said tub seat and back rest, a door for closing said opening and

means for sealingly engaging said door with said front wall when said tub is to contain bath water.

4,680,818

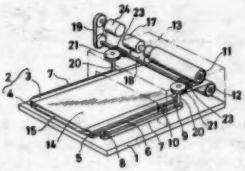
TRANSFER DEVICE FOR MOVING RECUMBENT PERSON

Akihiro Ooka, Suita; Kenji Okamoto, Kobe, and Koji Yamada, Suita, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,337

Int. Cl.[4] A61G *7/08*

U.S. Cl. 5—81 R **4 Claims**



1. A device for moving a recumbent person, comprising:

a baseplate;

a pair of rollers disposed at the proximal end of said base plate, each roller of said pair of rollers having independent drive means for rotating said roller in both forward and reverse directions;

an insertion plate consisting of two flat plates mutually fixed one above the other with a small gap therebetween and supported on said baseplate;

an upper belt having an upper end fixed to one of said pair of rollers and a lower end fixed to the other of said pair of rollers, said upper belt passing vertically over a front edge of the upper thin flat plate of said insertion plate and extending rearwardly from said front edge to said upper and lower ends thereof;

a lower belt having opposite ends secured to a front portion of said base plate at a lower surface of said lower plate, said lower belt passing over a top surface of said lower plate;

a pair of endless belts disposed on the opposite sides of said insertion plate;

a pair of coupling members for coupling said endless belts and said insertion plate;

pulleys supporting said endless belts; and

drive means independent of said roller drive means for driving said endless belts, whereby said insertion plate is driven in horizontal directions with respect to said base plate by said endless belts.

4,680,819

INVALID HOISTS

David R. James, Glenyard, England, assignor to James Industries Limited, Gloucester, England

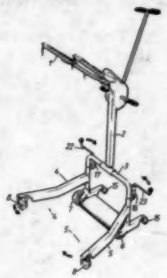
Filed Apr. 7, 1986, Ser. No. 848,647

Claims priority, application United Kingdom, May 1, 1985, 8511083

Int. Cl.[4] A61G *7/10*

U.S. Cl. 5—86 **10 Claims**

1. A mobile invalid hoist comprising a chassis, a lifting arm, and an upstanding support structure mounted on said chassis and from which said lifting arm projects, said chassis comprising a main chassis portion supporting the support structure, two coaxial fixed-axis support wheels mounted on said main chassis portion, two chassis side members mounted on said main chassis portion so as to project forwardly therefrom, said chassis side members being pivotally adjustable relative to said main chassis portion about respective vertical pivotal axes, and two front support castors mounted on said chassis side members, whereby pivotal adjustment of said chassis side members varies the track of said front support castors and the width of



a front opening of the chassis between said side members without varying the track of said fixed-axis support wheels.

4,680,820

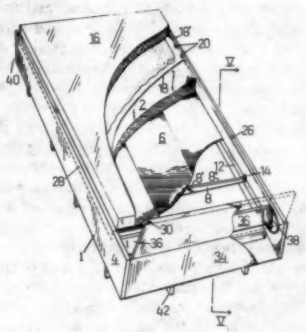
CONVERTIBLE WATER BED

Ronald D. Bittner, 12418 Quail Woods Dr., Germantown, Md. 20874

Filed Dec. 30, 1985, Ser. No. 814,498

Int. Cl.[4] A47C *27/08*; A47B *83/00*

U.S. Cl. 5—451 **11 Claims**



1. A waterbed comprising:

a bed frame;

first mattress support means on said bed frame for supporting a water-filled mattress;

a first water-filled mattress supported on said first mattress support means; and

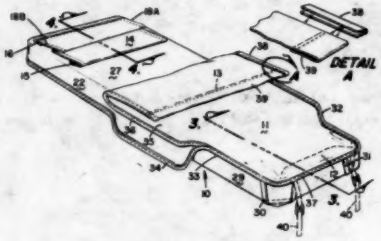
a second movable mattress movably supported on said bed frame for movement between a first storage position within said bed frame when said water-filled mattress is intended to be used and a second use position over said first mattress, so that said waterbed can be converted to a conventional bed by selectively moving said second mattress between said first and second positions.

4,680,821

SHEET BEDDING CONSTRUCTION FOR INSTITUTIONAL USE

Sara B. Maguire, 1952 Port provence, Newport Beach, Calif. 92660

Filed Nov. 26, 1984, Ser. No. 674,986
Int. Cl.[4] A47C 29/00; A47G 9/02
U.S. Cl. 5—413 8 Claims



1. An article of improved institutional bedding construction adapated to be used in combination with a substantially rectangularly shaped mattress having eight corners, four of the corners being on the upper portion of the mattress and the other four corners being on the bottom portion, comprising:

(a) a bottom sheet of substantially rectangularly shaped cloth material, having a head portion, an intermediate portion and a foot portion each of said head and foot portions having a pair of corners thereon, the head portion having a pair of sewn corners therein conformably mateable to the pair of corners disposed at the top of the head portion of the mattress so as to be fitted thereover, and further having along either side of the head portion of the bottom sheet a pair of edges extending below the head portion of the sheet that can cover the corresponding portion of the mattress from contact with the body of the user thereof so as to prevent soiling thereof, a further pair of elongated portions mediately disposed of the bottom sheet portion and extending adjacently below the pair of edges to provide full coverage of the mattress edge to prevent soiling of the mattress by contact with the user of the article of improved institutional bedding construction, and a foot portion which is substantially coextensive with the top of the foot portion of the mattress the elongated portions being formed as a second pair of edges substantially contiguous with and between said pair of edges and the foot portion;

(b) a top sheet of cloth material substantially coextensive with the bottom sheet, the top sheet being joined along the edges of its foot portion with the edges of the foot portion of the bottom sheet to form a bag for the user's feet; and

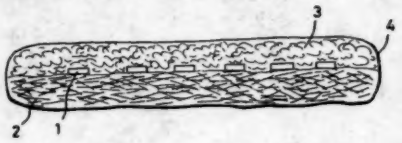
(c) a pair of elastic loops sewn into the bottom and side edges of the top and bottom sheets so as to be disposed in a diagonal fashion across the corners thereof for elastic engagement with the corners of the foot of the mattress to secure the bag portion of the sleeping bag in conformal engagement with the corners at the head of the mattress into more intimate engagement therewith.

4,680,822

BEDDING INCORPORATING FAR INFRARED RADIATOR

Yukio Fujino, Tokyo, and Morihiro Kabaya, Yokosuka, both of Japan, assignors to Nishikawa Sangyo Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,978
Claims priority, application Japan, Mar. 20, 1985, 60-57294
Int. Cl.[4] A47C 21/04; A47G 9/00
U.S. Cl. 5—421 2 Claims



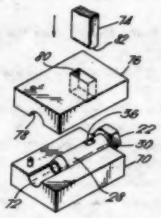
1. A bedding item comprising a far infrared wave radiating material therein, which material, when warmed up to approximately 36° C. by human body heat, radiates electromagnetic waves with a peak wavelength of from 8 to 14 μm.

4,680,823

METHOD OF MAKING A SELF-LOCKING BLIND FASTENER

Harvey P. Jeal, Stevenage, England, assignor to Avdel Limited, Hertfordshire, England

Filed Feb. 22, 1985, Ser. No. 704,207
Claims priority, application United Kingdom, Mar. 14, 1984, 8406710
Int. Cl.[4] B21D 53/24
U.S. Cl. 10—86 A 5 Claims



1. A method of making a self locking blind fastener having a nut including an enlarged head and a tubular shank, said tubular shank being internally threaded and having an inwardly depressed zone which extend over only a single minor circumferential sector of said shank and provide a protuberant zone of said internal threads for resisting movement of a bolt threaded in said shank, said method comprising the steps of:

supporting said shank in a nest having an aperture and a cavity, at least a portion of said cavity which is circumferentially opposite said aperture having a profile complementary to that of said shank;

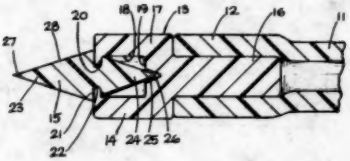
providing said shank in said nest with a longitudinal bending prestress opposite that imparted on said shank by a punch pressing step; and forming a depressed zone in a punch pressing step by introducing a punch through said aperture and pressing a face of said punch against said shank by a degree sufficient to depress the material of said shank.

4,680,824

FLEXIBLE GUN-BORE CLEANING IMPLEMENT WITH ROTATABLE PUSHER END

Nathan S. Lieptz, 23506 Beachwood Blvd., Beachwood, Ohio 44122

Filed Mar. 6, 1986, Ser. No. 836,728
Int. Cl.⁴ F41C *31/00*
U.S. Cl. 15—104.165 **5 Claims**



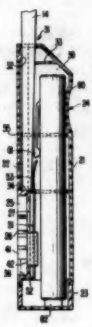
1. In a bore-cleaning implement for an air rifle, the combination of: a longitudinally-extending non-metallic flexible tubular body having a manual gripping means mounted at the trailing end thereof and a pusher assembly mounted on the leading end thereof, said pusher assembly having a rotatable front part adapted to engage a compressible cleaning pellet positioned in the bore of said air rifle and to push the pellet through said bore and having a rear part secured to said tubular body, said front part having an axially-elongated generally conical pellet-engaging portion at its forward end and being mounted for axial rotation relative to the longitudinal axis of said body in response to rifling-induced rotation as said cleaning pellet is pushed axially through said bore, the outer surface of said conical portion diverging from the front to the rear, whereby the trailing portion of said pellet is compacted and compressed by engagement with said conical portion to a greater extent than the leading portion of said pellet.

4,680,825

PRESSURE-SENSING TOOTHBRUSH HOLDER

Larry White, 111 W. Clinton, Hobbs, N. Mex. 88240, and Luis Ingels, 242 S. Irwindale, Asuza, Calif. 91702

Filed Sep. 10, 1985, Ser. No. 774,450
Int. Cl.⁴ A47B *9/04*
U.S. Cl. 15—105 **18 Claims**



1. A device for indicating that a force being applied by a toothbrush against teeth exceeds a variable, preset value, including holding means for holding a toothbrush to allow manual application of force of the toothbrush, adjustment means for adjustably presetting the amount of force required to be applied to the toothbrush to cause pivoting motion, sensing means for sensing said pivoting motion of the toothbrush when said preset amount of force is applied to said toothbrush, and indicator means for indicating when said sensing means said pivoting motion, wherein the improvement comprises:

said holding means consisting of a single holder, said holder having a friction surface and a rib for supporting the toothbrush; and

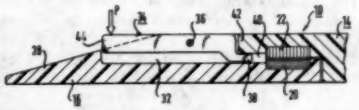
said adjustment means, sensing means and indicator means being included in said holder.

4,680,826

FLOOR WIPER FRAME

Roland Schunter, Lorch-Waldhausen, Fed. Rep. of Germany, assignor to Floordress Reinigungsgeraete, Lorch-Waldhausen, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,132
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432685
Int. Cl.⁴ A47L *13/258*
U.S. Cl. 15—147 R **12 Claims**



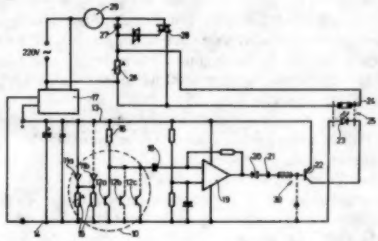
1. In a frame for a floor wiper comprising a flat frame shape equipped with a handle socket which frame shape is formed by two frame portions which are pivotal with respect to each other and adapted to be locked in their fully extended position by means of a holding magnet locking means, the improvement consisting of a pedal disposed on one of said two frame portions having an extension engaging the other of said two frame portions, which pedal is moveable in the direction of separation of said two frame portions whereby said holding magnet locking means is disengaged.

4,680,827

VACUUM CLEANER

Karl Hummel, Stuttgart, Fed. Rep. of Germany, assignor to Interlava AG, Lugano, Switzerland

Filed Dec. 30, 1985, Ser. No. 814,545
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534621
Int. Cl.⁴ A47L *9/28*
U.S. Cl. 15—319 **4 Claims**



1. A vacuum cleaner comprising a housing, a blower within said housing for creating the vacuum, a motor connected to said blower for driving said blower, a control circuit connected to said motor for controlling the operation thereof in response to a control signal, a suction channel extending from said blower to the exterior of said housing to provide a path for the movement of material picked up by said vacuum cleaner, at least a light transmitter and a light receiver in said suction channel positioned so that the material will pass between said light transmitter and receiver, and sensing means connected to

said receiver and said control circuit for sensing changes in the light transmission characteristics between said transmitter and receiver due to the material passing therebetween and for producing a control signal proportional thereto; characterized in that said sensing means includes a control light transmitter at the output thereof, and a light-sensitive resistor connected in circuit with said control circuit and responsive to changes in the light produced by said control light transmitter to vary the power applied to said motor.

4,680,828

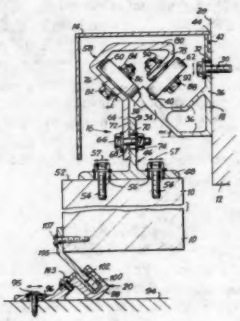
HARDWARE FOR MOUNTING A SLIDING DOOR PANEL

Sanford L. Cook, and David Kirkup, both of Ocean, N.J., assignors to Standard-Keil Hardware Manufacturing Co., Allenwood, N.J.

Continuation-in-part of Ser. No. 595,887, Apr. 2, 1984, abandoned. This application Jul. 24, 1985, Ser. No. 758,606

Int. Cl.⁴ E05D *15/08*

U.S. Cl. 16—90 **22 Claims**



1. Mounting hardware for supporting a door panel for sliding movement across a door opening in a structure, the mounting hardware comprising:

an elongated track for attachment above a door opening in a structure, the track comprising first, out-ward-facing, and second running surfaces which are oriented at right angles one to the other, the running surfaces being at an angle of less than 90° to the horizontal when the track is attached to the structure;

at least two trolley assemblies each comprising a frame and a pair of trolley wheels, the frame supporting the trolley wheels for rotation about mutually perpendicular axes so that the rolling surface of each trolley wheel is in rolling contact with one of the running surfaces of the track, the trolley frame comprising an integral body having a substantially vertical, downwardly-extending dependent portion for supporting the door panel, an outward-extending portion on and extending upward from the dependent portion for supporting on its upward, inwardly-facing side, one of the trolley wheels in position to contact the first outward-facing running surface of the track, an intermediate portion fastened to the outward-extending portion and extending completely across the track, and a downward-extending portion on and extending inwardly from the intermediate portion which supports the other trolley wheel in position to contact the second running surface of the track.

4,680,829

HOLLOW SHEET METAL UTENSIL HANDLE FASTENING ASSEMBLY

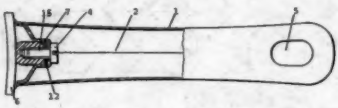
Rolf Baumgarten, Neunkirchen-Wiederstein, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG, Neunkirchen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,154

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 8436478[U]

Int. Cl.⁴ B25G *3/26, 3/30*

U.S. Cl. 16—114 A **8 Claims**



1. In a handle assembly for facilitating a fastening of a hollow sheet metal handle to the side wall of a utensil, the improvement comprising a welding bolt adapted to be weldably secured to the side wall of the utensil and project outwardly therefrom, said welding bolt having a polygonal cross section and an internally threaded bore in a contact surface on said welding bolt facing away from the utensil, the axis of said bore extending transversely of the side wall of the utensil, a sheet metal shaped part and welding means for fixedly attaching said sheet metal shaped part to said sheet metal handle, said sheet metal shaped part having a means defining a recess having a shape conforming to the shape of said welding bolt and adapted to receive said welding bolt therein, said sheet metal shaped part also having at least two plates forming extensions of at least two walls of said means defining a recess, said plates extending toward the side wall of said utensil and straddling said welding bolt, said recess means having a bottom wall with an opening therethrough, a fastening screw received through said opening and threadedly engaged with said internally threaded bore, so that upon a tightening of said screw, a securement of said sheet metal handle to the side wall of said utensil will be effected, said screw effecting a drawing of said bottom wall of said recess means into engagement with said contact surface to thereby prevent said plates and said sheet metal handle from engaging the side wall of said utensil with an undue amount of force to cause deformation of the utensil wall.

4,680,830

FURNITURE HINGE HAVING AN INTERMEDIATE MOUNTING MEMBER AND A SEPARATE DISENGAGING MECHANISM

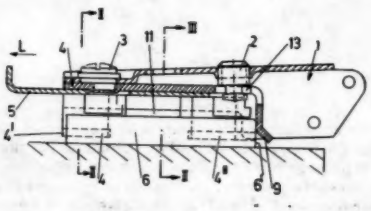
Erich Röck, Höchst; Helmut Rupprechter, and Klaus Brüstle, both of Lauterach, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 3, 1985, Ser. No. 783,638

Claims priority, application Austria, Oct. 19, 1984, 3340/84

Int. Cl.⁴ E05D *7/06*

U.S. Cl. 16—241 **7 Claims**



1. A furniture hinge comprising:

a mounting plate to be mounted on a wall of an article of furniture, said mounting plate having an inner side to face the furniture wall, an outer side to be directed away from the furniture wall, and opposite lateral sides having outwardly facing grooves therein;

a hinge arm having a U-shaped profile and to be connected to a door of the article of furniture;

an intermediate member for mounting said hinge arm on said mounting plate, said intermediate member being connected to said hinge arm by means of an adjustment element for adjusting the spacing between said hinge arm and said mounting plate and by means of an adjustment member for adjusting the position of said hinge arm relative to said mounting plate in a longitudinal direction parallel to said lateral sides;

said intermediate member being formed of sheet steel and having integral resilient side clamp portions, such that said hinge arm and said intermediate member may be manually pushed in a direction toward said outer side of said mounting plate and said clamp portions resiliently snap into and engage in said grooves with said intermediate member including said clamp portions embracing said mounting plate; and

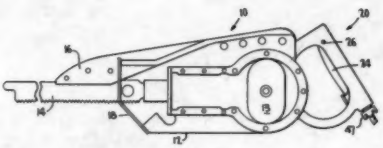
separate spreading means mounted on said intermediate member for relative movement therebetween for spreading said clamp portions apart and disengaging said clamp portions from said grooves such that said intermediate member and said hinge arm may be released from said mounting plate.

4,680,831

POWER TOOL DEVICE

Timothy Hogan, 154 Kingsdale Rd., Suffolk, Va. 23434

Filed Jul. 30, 1985, Ser. No. 760,591
Int. Cl.[4] A22B 5/20
U.S. Cl. 17—23 **1 Claim**



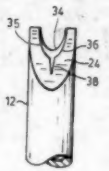
1. A power tool device comprising a housing, a rotary motor within the housing which is capable of driving a reciprocating type saw blade, a reciprocable saw blade operatively connected to the motor and extending from the housing, a hardgrip having a contoured exterior which extends from the housing opposite from the blade, the handgrip being generally in the shape of a D with one straight portion and curved portion attached to the ends of the straight portion, the handgrip containing a snap type switch for actuating the motor and thus reciprocating the saw blade, the switch comprising first and second electrical contacts which are biased away from contacting each other, and a metallic switch housing containing the contacts, the switch housing being surrounding by electrically insulating flexible sheathing and including a planar base portion and a cover portion including a hinged dome-shaped member having an arm which under applied mechanical pressure is capable of moving the second electrical contact into electrical contact with the first contact, the second contact being of a complex shape having a bight-shaped portion and having a contact point, the second contact being mounted on the base portion of the housing such that the bight-shaped portion is biased higher relative to the base portion than the contact point, the handgrip having a switch chamber which contains the switch and has an opening on the exterior of the handgrip of sufficient size to remove the switch, the switch chamber being within the straight portion of the handgrip, a cover plate closing the opening of the switch chamber and removably attached to the handgrip by screws, the switch chamber being formed such that its surfaces containing threaded holes for the screws are recessed a distance equal to the thickness of the cover plate such that the external surface of the cover plate is flush with the exterior of the handgrip, electrical wires extending from the switch through an aperture in the handgrip and secured thereto by a cooperating fitting and cap, and a trigger pivotally mounted by a pin within a slot in the handgrip, the trigger biased by a spring and including an actuator contacting the switch and capable of closing the electrical contacts by a mechanical pressure.

4,680,832

MEAT TENDERIZING NEEDLE

Jacobus J. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Oct. 6, 1986, Ser. No. 915,378
Int. Cl.[4] A22C 9/00
U.S. Cl. 17—25 **4 Claims**



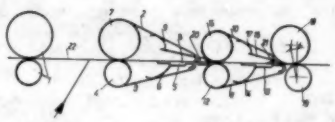
1. A meat tenderizing needle comprising an elongated body which is circular in cross-section, said body having a distal end and a proximal end, said distal end of said body being sharpened to provide first and second side faces which converge and meet at a first cutting edge, and a third side face which is located centrally of the width of the first side face and which is inclined so as to intersect the second side face at a point spaced from the first cutting edge to form a pair of tangs which are separated by a notch, said notch having a root edge forming a cutting edge toward which sinew in the meat which is being penetrated by the needle will be guided by the notch to be cut by the cutting edge rather than merely deflected out of the path of the needle.

4,680,833

DRAWING APPARATUS

Dinko A. Bahov, Gabrovo, and Hristo A. Bahov, Stara Zagora, both of Bulgaria, assignors to NPK "Textilling Maschinostroene", Gabrovo, Bulgaria

Filed May 9, 1386, Ser. No. 861,497
Int. Cl.[4] D01H 5/86
U.S. Cl. 19—244 **2 Claims**



1. A roving and sliver drafting apparatus, comprising:

a pair of input drafting rollers receiving a roving to be drawn between them;

a first pair of drafting aprons each comprising an endless band passing over a respective roller disposed downstream of said input drafting rollers and receiving said roving from said input drafting rollers;

a further pair of drafting aprons each comprising an endless band passing over a respective roller disposed downstream of said first pair of drafting aprons and receiving said roving from said first pair of drafting rollers, said

bands of said further pair of drafting rollers forming an upper and a lower band having downstream ends at which said roving emerges; and

a pair of output drafting rollers downstream of said further pair of drafting aprons and receiving the roving emerging from said downstream end, said pair of output drafting rollers including a lower drafting roller having an axis, and an upper drafting roller having an axis, said axis of said upper drafting roller being offset angularly about said axis of said lower roller toward said further pair of drafting aprons from a position in which said axes are coplanar and lie in a plane perpendicular to a drafting plane defined by said pair of input drafting rollers and said pairs of drafting aprons to cause said upper drafting roller to overhang said downstream end of said lower band.

4,680,834

CABLE TIE

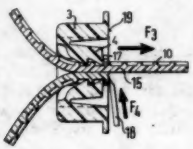
Guy Andre, Seyssinet-Pariset; Robert Gollin, Grenoble, and Gaetan Daloia, Echirolles, all of France, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 885,777

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525351

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 PB **5 Claims**



1. A cable tie comprising a tightening strap of indeterminate length having a plurality of transverse ribs on at least one longitudinal surface thereof and a separate locking piece having a housing, an orifice in the housing through which two ends of the tightening strap can pass, and locking means projecting into the orifice from opposite sides of the housing for interacting with the transverse ribs, each of said locking means having at least one engaging tooth that operates in a first locking direction for engaging a rib of one end of the strap and preventing it, when engaged with a tooth, from passing through the orifice in the opposite direction, the gap between the teeth being larger than the thickness of the strap, but smaller than double the strap thickness less the height of a rib, with at least one of said locking means being resiliently connected to the housing so that it can flex open to permit one end of the strap to pass through the orifice in said first direction but will spring back to engage its tooth with a rib of the strap to prevent it from passing back in said opposite direction.

4,680,835

SPORT SHOE LACING DEVICE

Sheng-Chorng Horng, No. 590-2, Chung Cheng Road, Tsao Tun Chen, Nan Tou, Taiwan

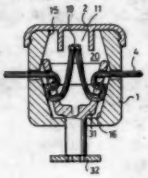
Filed Apr. 30, 1986, Ser. No. 857,342

Int. Cl.[4] A43C *7/00*

U.S. Cl. 24—117 **3 Claims**

1. A shoelace lacing device comprising a housing having a central hollow space contained within a rear face, front face, top face and side faces of said housing, a notch being on the rear face of housing, the front face of said housing and side faces of said housing each being provided with an oval-shaped hole, a square hole being provided at a rear end of each side face of said housing, said central hollow space being hexagonally-shaped so as to form front and rear inclined edges, respectively, the surfaces of said front inclined edges being treaded, the top face of said housing having a fastening seat and a oval-shaped hole to clamp the shoelace;

a fastener body which is a bow-shaped element with two ends and an inner surface, one hook being at the inner surface of each end of the fastener such that each hook is exactly fixed to each of said square holes of the housing, and two parallel plates extending into the central region of the fastener body;



a Y-shaped piece comprising a base and extending from said base are elastic tips having holes along the surface of tips for the passage of lace, tiny protrusions extending from the base of the Y-shaped element such that said tiny protrusions can be engaged with a horizontal plate for pressing said Y-shaped pieces.

4,680,836

ONE-PIECE PLASTICS FASTENER

David R. Wisecup, Xenia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 23, 1985, Ser. No. 812,539

Int. Cl.[4] B65D *33/34*

U.S. Cl. 24—150 FP **5 Claims**

1. A one-piece fastener composed of flexible, molded, plastics material, the fastener comprising a socket, a head and a flexible filament connected at its one end to the socket and at its other end to the head, the socket having a passage therethrough, the socket having opposite first and second ends, the head being insertable into the passage from either end of the socket, the socket having flexible resilient prongs disposed in the passage for non-releasably gripping the head when inserted through the first end and adapted to releasably grip the head in the event the head could be inserted through the second end to a sufficient depth, and means on the head and contactable with the socket for limiting the depth to which the head can be inserted through the second end of the socket to prevent the head from being releasably engaged with the prongs.

4,680,837

PLASTIC SWIVEL CONNECTOR AND MOLD THEREFOR

Leon Rubinstein, 9 Fox Hill Dr., Natick, Mass. 01760

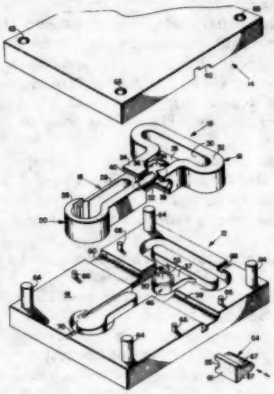
Filed Dec. 23, 1985, Ser. No. 816,101

Int. Cl.[4] A44B *13/00*

U.S. Cl. 24—237 **15 Claims**

1. A swivel connector comprising two major parts that are

injection molded of plastic in a one-shot injection molding process such that said major parts, within limits can't be pulled apart but are free to rotate with respect to one another, one of said major parts including a clip for releasably attaching to a ring and the other of said major parts including portions which define a other of said major parts including portions which define a loop for attachment to a strap or the like, said one major part further including a neck that extends from said clip and terminates in a head at one end of said one major part and wherein said other major part includes other portions which define an interior space in which said head and portions of said neck are formed during the injection molding process, said



interior space of said second major part opening to the exterior of said second major part along an axis in one direction to provide access for the formation of said head and along another direction, different from said one direction, to provide access for the formation of at least part of said neck where said neck and said head join, said second major part having a generally flat parallelopiped shape with a cylinderical bore extending through the largest opposed sides thereof along said axis in said one direction and a recessed slot in an edge thereof extending along said other direction, said slot and said bore being arranged so that they intersect one another to define said interior space of said second major part.

4,680,838

DEVICE FOR DETACHABLY CONNECTING TWO ELEMENTS

Franz Astl, A-6345 Kössen, Tyrol, Austria

PCT No. PCT/AT81/00002, § 371 Date Oct. 9, 1981, § 102(e) Date Oct. 9, 1981, PCT Pub. No. WO81/02332, PCT Pub. Date Aug. 20, 1981

Continuation of Ser. No. 314,075, Oct. 9, 1981, abandoned. This PCT application Feb. 12, 1981, Ser. No. 600,212

Claims priority, application Austria, Feb. 12, 1980, 749/80

Int. Cl.[4] A44B *18/00*

U.S. Cl. 24—442 **19 Claims**

1. In a releasable connecting applicance:

a female part forming a hole defined by an inner surface;

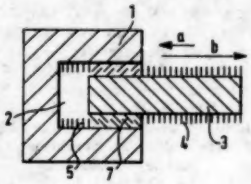
a male part defined by an outer surface adapted for movement from a disengaged position in a predetermined direction in said hole to assume an engaged position;

each of said surfaces having an area extending at least partly parallel to said direction, at least a portion of said area of each of said surfaces being uneven as to show elevations and depressions;

a layer of adjacently arranged elastic fiber elements in at least one of said surfaces, the peaks of said fiber elements forming the elevations in said at least one of said areas;

the length of said fiber elements on at least one surface being greater than the spacing between the depressions on said at least one surface and the elevations of the other surface;

said fiber elements being straight over their entire length and free of hook-like recesses on their surface for interengagement with said surface;



whereby during insertion of said male part into said female part a bending force has to be overcome to bring said fiber elements from their normal position relative to the direction of insertion to an inclined position in the direction of insertion; and

said elastic fiber elements resisting a movement in the opposite direction.

4,680,839

LINK CHAIN, ESPECIALLY A TENTERING CHAIN

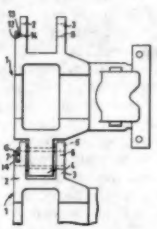
Hans Cramer, Aachen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,898

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510856

Int. Cl.[4] D06C *3/02*

U.S. Cl. 26—89 **6 Claims**



1. A link for a chain, comprising a link body, a pair of connecting lugs (2, 3) projecting from one end of said link body, a connecting tongue (4) projecting from an opposite end of said link body, a spacing between said connecting lugs for receiving a connecting tongue of a neighboring link body, axially aligned holes in said connecting lugs and in said connecting tongue, a cylindrical connecting pin having a uniform diameter throughout its length extending through said axially aligned holes, said cylindrical connection pin having an end portion projecting laterally and axially outwardly from an outer wall surface of one of said connecting lugs, said end portion of said cylindrical connecting pin having a radial through-bore (7), a two-pronged locking spring (9) having a first prong (8) extending through said through-bore, and a second prong (10) engaging said cylindrical connecting pin, said first prong (8) having a first straight prong end (15) and a second prong end (15') angled away from said second prong (10), both prong ends extending out of said radial through-bore (7), said one connecting lug having a lateral outwardly extending shoulder (14), a groove (13) in said shoulder (14) extending in parallel to said outer wall surface for receiving said first and second prong ends, a groove bottom (12) in said groove (13), said first prong (8) extending at an angle to said groove bottom, said groove

(13) having such a depth that said first straight prong end and said second angled prong end of said first prong (8) rest against said groove bottom for securely holding said locking spring in a pin locking position and for preventing any axial movement of said cylindrical connecting pin.

4,680,840

METHOD FOR PREPOLARIZING AND CENTERING A PIEZOCERAMIC POWER SWITCHING DEVICE

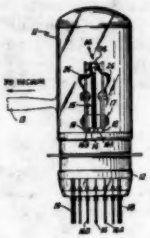
John D. Harnden, Jr., Schenectady; William P. Kornrumpf, Albany, and George A. Farrall, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 685,108, Dec. 21, 1984, abandoned. This application Mar. 14, 1986, Ser. No. 839,768

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 **1 Claim**



1. The method of prepolarizing and centering the movable piezoceramic bender member of a piezoceramic bender-type switching device contained within a protective gastight enclosure which comprises substantially completing the fabrication assembly of all of the major components of the piezoceramic switching device into a unitary structure mounted within the protective gastight enclosure and sealed closed, applying a relativey high value prepolarization potential to the respective piezoceramic plate elements of the bender member while maintaining the plate elements near their Curie temperature to achieve dipole alignment of the dipoles of the piezoceramic material and simultaneously adjusting the relative magnitudes of the prepolarizing potential applied to the respective piezoceramic plate elements of the bender member to cause it to precisely position the movable switch contacts mounted thereon relative to fixed load current switch contacts of the switching device.

4,680,841

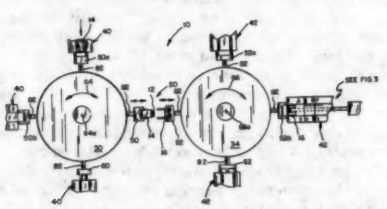
ELECTRICAL HARNESS FABRICATION APPARATUS

Thomas E. Schneider, Burbank; Clarence Kolanowski, La-Grange, and Richard L. Patterson, Riverside, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 17, 1985, Ser. No. 745,171

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—33 M **16 Claims**



1. In an apparatus for mass terminating a plurality of insulated electrical conductors to an electrical connector having insulation displacing terminals, by inserting said conductors in corresponding terminals, said apparatus including

a termination station,

a loading station remote from said termination station,

a turret mounted between said loading and said termination stations for stepped rotation,

a first connector holder mounted to said turret adapted to receive said connector,

means at the loading station for loading said connector one-at-a-time in said first connector holder,

means for rotating the turret so that the first connector holder is moved from the loading station to the termination station,

means for feeding said plurality of electrical conductors to the termination station at a position immediately adjacent and aligned with said connector terminals,

terminator means for inserting said conductors in said terminals to form a cable harness, and

means for ejecting said cable harness from said termination station,

the improvement comprising:

a flat, multiconductor cable including said conductors;

said electrical connector including two mating parts, with said cable being terminated between said two connector parts;

said loading means being operable to load a first connector part in said first connector holder;

a second turret mounted adjacent said termination station for selective stepped rotation;

a second connector holder disposed on said second turret adapted to receive a second connector part;

a second loading station remote from said termination station;

means at the second loading station for loading said second connector part one-at-a-time in said second connector holder;

means for rotating the second turret so that the second connector holder is moved from the second loading station to the termination station to align said first and said second connector parts in an opposed spaced-apart relationship;

said conductor feeding means is operable to selectively advance a predetermined portion of said cable between said first and said second connector parts; and

said termination means including means for compressing said first and second connector parts together in mating relationship to mass terminate said cable therebetween;

whereby a continuous succession of mating connector parts can be terminated to a continuous length of cable to form at least one cable harness.

4,680,842

MULTIPLE PART SIMULTANEOUS FORMING APPARATUS

William D. Moyer, Palatine, Ill., assignor to Automation Associates, Inc., Arlington Heights, Ill.

Filed Aug. 15, 1985, Ser. No. 765,844

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 29—33 P **16 Claims**

1. An apparatus for simultaneously working a plurality of workpieces, comprising:

a support wheel defining a rotary axis and a periphery;

means for rotatably indexing said support wheel in preselected angular steps about said axis;

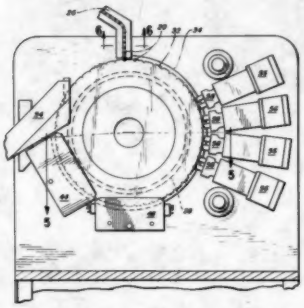
receiving means on said support wheel periphery for receiving one each said workpieces in similar orientation;

retaining means for fixedly retaining said workpieces in said receiving means;

first working means for simultaneously similarly first working a first worked portion of each of a preselected plurality of the workpieces retained in said receiving means, said

plurality corresponding in number to one of said angular steps, to define a plurality of partially worked workpieces;

sensing means for simultaneously sensing the condition of the first worked portion of each of the worked workpieces and preventing further indexing of said support wheel in the event an undesirable condition of the first worked portion of any one of the workpieces is sensed;



second working means for further working the first worked portion of each of said workpieces subsequent to sensing of the condition thereof by said sensing means; and

means for delivering seriatim the further worked workpieces from said receiving means.

4,680,843

APPARATUS FOR ROTATING THE SHELLS OF ROLLS IN CALENDERS OR THE LIKE

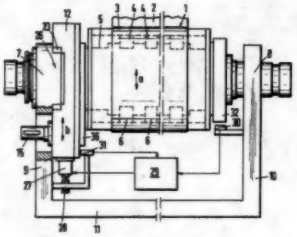
Dieter Junk, Kreuztal, and Richard Rauf, Krefeld, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,671

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532843

Int. Cl.[4] B21B *13/02*; B05C *1/08*

U.S. Cl. 29—116 R **19 Claims**



1. In a roll assembly the combination of an elongated carrier; a cylindrical shell spacedly surrounding and movable radially of said carrier; and drive means for rotating said shell, including a housing which is movable relative to said carrier in a substantially radial direction of said shell, a driven rotary element journalled in said housing and arranged to transmit torque to said shell, signal generating means for monitoring the radial position of said shell, and means for adjusting the position of said housing relative to said carrier in response to signals from said monitoring means.

4,680,844

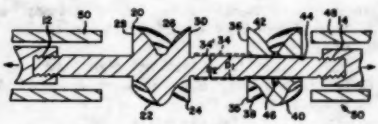
METHOD OF MANUFACTURING A ROTOR

James W. Rupp, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 23, 1985, Ser. No. 812,610

Int. Cl.[4] B23P *15/00*; B21D *39/00*

U.S. Cl. 29—156.4 R **7 Claims**



1. A method of manufacturing a rotor for use in an air motor comprising the step of:

placing a shaft having a first end and a second end in a fixture, said shaft having a first section with a series of spiral grooves which extend from a first face to a second face, said first and second faces being located in parallel radial planes which are substantially perpendicular to the axis of said shaft, said shaft having a second and third section located between said first section and said second end, said second section having a larger diameter than said third section;

sliding a ring on said third section, said ring having a peripheral surface with a second series of spiral grooves that extend from a third face to a fourth face, said ring having an inner diameter that is greater than said third section but less than said second section;

pulling on said first and second ends causing said shaft to expand axially while being radially compressed until the diameter of said second section substantially equals the inner diameter of said ring;

pushing said ring into said second section until said third face engages said second face; and

releasing said first and second ends to allow said shaft to axially contract and radially expand to produce a first locking connection between said inner diameter and said second section such that said first and second spiral grooves form a herringbone pattern for said rotor.

4,680,845

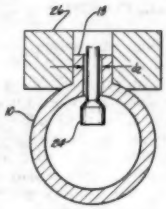
METHOD OF MANUFACTURING LATERAL HEADER EXTENSIONS

Donald E. Miller, Adrian, Mich., assignor to Brazeway, Inc., Adrian, Mich.

Filed Jan. 31, 1986, Ser. No. 824,667

Int. Cl.[4] B21D *53/00*

U.S. Cl. 29—157 R **6 Claims**



1. A method of raising a hollow lateral extension on a header tube comprising the steps of:

(a) inserting a tool of working diameter d_1 through the extension and into the header tube;

(b) mechanically deforming the extension to a reduced inner diameter d_2, which is less than d_1; and

(c) while maintaining the outer diameter of the extension withdrawing the tool through the extension to restore the inner diameter to d_1 by lengthening and reducing the wall thickness of the extension.

4,680,846

MATERIAL SAVING METHOD FOR TRUING TRACK WHEELS

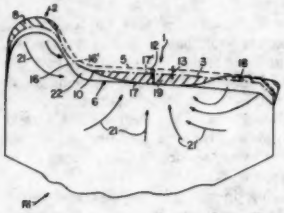
Herbert Feldewert, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,039

Claims priority, application European Pat. Off., May 17, 1985, 85106088.9

Int. Cl.[4] B21H *1/04*

U.S. Cl. 29—168 **9 Claims**



1. A method for making a restored track wheel by restoring a worn track wheel having a worn peripheral profile with a tread section and with a flange section, so that the restored track wheel will have a restored peripheral profile, comprising the following steps: ascertaining on said worn peripheral profile first worn zones of lesser wear, ascertaining on said worn profile second worn zones of higher wear, subjecting only said first zones of lesser wear to a material displacing deformation for forcing material out of said first zones into said second zones for forming a partially restored profile, determining on said partially restored profile locations requiring a material removal by a truing operation for producing said restored profile, and performing a material removing truing operation on said determined locations for obtaining said restored profile, whereby the quantity of material to be removed by said truing operation is minimized.

4,680,847

METHOD OF PRODUCING A SPRING PLATE

Friedrich Bauer, Vienna, Austria, assignor to ENFO Grundlagenforschungs AG, Döttingen, Switzerland

Division of Ser. No. 664,969, Oct. 26, 1984, abandoned. This application May 5, 1986, Ser. No. 859,697

Claims priority, application Austria, Oct. 31, 1983, 3856/83

Int. Cl.[4] B21D *53/00*

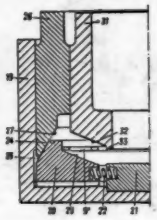
U.S. Cl. 29—173 **3 Claims**

1. A method of producing a spring plate which comprises the sequential steps of

(1) providing a flat plate made of a spring-plate material, said flat plate having a predetermined thickness,

(2) punching an annular rough plate from said flat plate, said rough plate being defined by generally radially-extending webs having inner ends and outer ends, inner bridges connecting the inner ends of alternating pairs of said webs and outer bridges connecting the outer ends of the alternating pairs of said webs whose inner ends are unconnected, the inner bridges providing an inner edge for the rough plate and the outer bridges forming an outer peripheral edge for the rough plate, said inner and outer bridges and said webs providing a meander configuration to said rough plate, said rough plate defining an imaginary plane and an imaginary center, and

(3) deforming said rough plate by engaging the outer peripheral edge and radially pressing thereon toward said imaginary center and compressing said rough plate along said imaginary plane until spacings between the outer ends of



said webs and spacings between the inner ends of said webs are at least 10% less than said predetermined thickness, thus forming said spring plate.

4,680,848

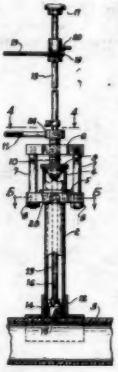
PIPE TAPPING TOOL

Erwin P. Goldner, 2727 Felton St., San Diego, Calif. 92104

Filed Nov. 25, 1985, Ser. No. 801,215

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—213 R **6 Claims**



1. A machine for safely cutting a hole in the wall of a pressure container within a duct having an end externally attached to said pressure container and the other end unattached and open which comprises:

a clamp removably attached to said duct near the unattached end;

a bracket placed outboard of said unattached end, structurally supported from said clamp;

a hollow rod supported within said cavity and extending

from both directions, said support allowing rotation and axial motion of said rod;

a hollow shaft coaxial with said duct and rod, with an interior diameter commensurate wtih the exterior diameter of said rod and a threaded exterior supported by said bracket;

a seal backing plate with a threaded hole, threadably attached near one end of the exterior of said shaft proximate to said unattached end;

a conical seal attached to said backing plate, having an axial hole commensurate with the exterior diameter of said shaft, and a maximum exterior diameter larger than said unattached end, said seal being forced into said unattached end;

means attached to the end of said rod opposite said wall for cutting holes in said wall;

means to rotate and move said hollow rod axially;

said rod having a first fluid passage from the exterior of said rod to the hollow interior near said means for cutting holes, said first passage size being sufficient to vent or fill said duct to normal pressures within said container and

a second fluid passage from the interior of said hollow rod to the exterior of said rod near the end of said rod opposite to said means for cutting holes, the size of said second passage size being similar to the size of said first passage; and

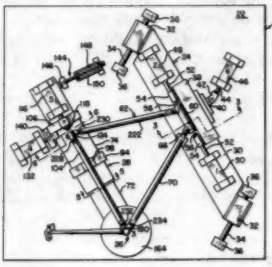
a means to control fluid flow in said fluid passages.

4,680,849

APPARATUS FOR ASSEMBLING A BICYCLE FRAME

Robert L. Diekman, Dayton, Ohio, assignor to Huffy Corporation, Dayton, Ohio

Filed Aug. 29, 1985, Ser. No. 770,801
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—252 **11 Claims**



1. An apparatus for assembling a bicycle frame comprising:

a substantially flat base;

means for clamping a bottom bracket to said base, said clamping means defining a pivot axis oriented substantially perpendicularly to said base;

swing arm means attached to said base to pivot about said pivot axis;

means movable with said swing arm means for supporting a seat bracket on said swing arm means and displacing said seat bracket assembly along said swing arm means toward said pivot axis;

means mounted on said base for pivoting said swing arm means about said pivot axis;

carriage means displaceably mounted on said base for movement toward and away from said pivot axis and said swing arm;

means mounted on said carriage means for engaging and holding a head tube at a predetermined position on said carriage means; and

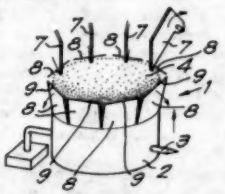
means mounted on said base for displacing said carriage means toward said pivot axis.

4,680,850

PROCESS FOR REMOVING THE WRAPPER FROM A FIBRE BUNDLE

Leonel Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boucherie, Belgium

Filed Feb. 4, 1986, Ser. No. 826,952
Claims priority, application Belgium, Feb. 26, 1985, 2/60629
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—426.3 **11 Claims**



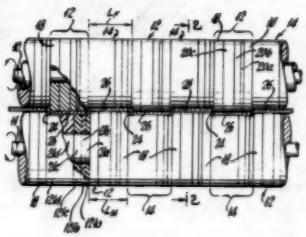
1. Process for removing the wrapper from a fibre bundle, characterized thereby that it mainly consists in successively gripping the fibre bundle (1) at the wrapper (2), freeing the embraced bundle of fibres (4) over a determined length from said wrapper (2), gripping said bundle of fibres (4) at the freed part and removing said fibre bundle from said wrapper (2), and carrying said fibre bundle away to a suitable arrangement, while the empty wrapper (2) is carried away as waste.

4,680,851

METHOD OF SETTING UP ROTARY SLITTER TOOLING

Gene A. Legg, Lumberport, W. Va., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Apr. 22, 1986, Ser. No. 855,530
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—433 **12 Claims**



1. In a method of setting up tooling on two axially parallel driven rotary arbors for cutting plural parallel longitudinal slits on a web of sheet material advancing between the arbors in a direction transverse to the axes of the arbors, using a set of tooling comprising a multiplicity of circular tooling elements individually mountable on either arbor and including cutter elements and spacer elements, each tooling element of said set having a predetermined nominal axial length and an actual axial length deviating from its nominal length within a tolerance range of $\pm t$, where t is an absolute value of length, said method including the steps of

(a) selecting a first group of said tooling elements from the set for mounting on a given axial portion of one of the arbors, and a second group of elements from the set for mounting on a corresponding axial portion of the other arbor in register with said given axial portion of said one arbor, such that the sum of the nominal axial lengths of the first-group elements equals the sum of the nominal axial lengths of the second-group elements plus a predeter-

mined value K, said first group consisting of a predetermined number of elements and said second group consisting of a predetermined number of elements, and

(b) mounting the first-group elements and the second-group elements respectively on the given portion of the one arbor and on the corresponding portion of the other arbor, the improvement which comprises

(c) each of the tooling elements of the set being detectably identified with one of a plurality of defined, discrete, successive subranges of said tolerance range ±t, in accordance with the sign and absolute magnitude of the deviation d_e between a measured value of actual axial length of the element and the nominal axial length of the element, said subranges being so defined that the value of d_e of any given element of the set lies within one of said subranges, and each element of the set being identified as aforesaid with that one of said subranges in which its value of d_e lies, and

(d) the selecting step including selecting, as the elements of said first and second groups, elements identified as aforesaid with particular ones of said subranges such that the subranges with which the first-group elements are identified cumulatively balance the subranges with which the second-group elements are identified for limiting the difference D between the sum of the values d_e of the first-group elements and the sum of the values d_e of the second-group elements to a predetermined range of values of D.

4,680,852

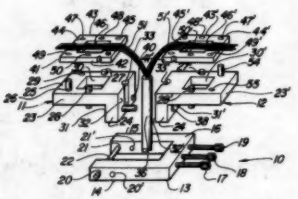
ROUND ELECTRICAL CABLE ADAPTING TOOL

Anthony Centore, R.D. #5, Amsterdam, N.Y. 12010

Filed Jun. 26, 1986, Ser. No. 878,612

Int. Cl.[4] H01R *43/28*; B23P *19/00*

U.S. Cl. 29—461 **20 Claims**



1. A tool effective to adapt an end of a round electrical cable having a plurality of individual conductor strands to a flat electrical cable for termination thereof comprising in combination:

(a) clamping means to clamp and retain a round electrical cable therein,

(b) a pair of grid frame means to support a plurality of said individual conductor strands in each frame means in a grid configuration with each grid comprising a series of closely spaced side by side parallel conductor strands,

(c) holder means in said clamping means to support said pair of grid frame means in closely spaced parallel relationship with the conductor strands of one grid offset from and parallel to adjacent strands in the other grid,

(d) anvil means in said clamping means, said anvil means oppositely abutting said grids and operative to press said grids towards each other to press the strands of the one grid between the strands of the other grid so that a single planar grid is defined in which all strands are coplanar,

(e) means on said clamping means to remove said single grid from said clamping means as an integral unitary grid comprising an elongated flat section of closely spaced side by side parallel conductor strands capable of being treated as a flat electrical cable.

4,680,853

PROCESS FOR MANUFACTURE OF HIGH POWER MOSFET WITH LATERALLY DISTRIBUTED HIGH CARRIER DENSITY BENEATH THE GATE OXIDE

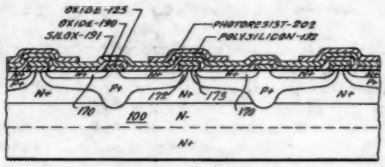
Alexander Lidow, Manhattan Beach, and Thomas Herman, Redondo Beach, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

Division of Ser. No. 178,689, Aug. 18, 1980, Pat. No. 4,593,302.

This application May 30, 1986, Ser. No. 869,109

Int. Cl.[4] H01L *21/425*

U.S. Cl. 29—571 **12 Claims**



1. A process for fabricating a power semiconductor device, comprising the steps of:

(a) providing a wafer having first and second layers, said first layer being of one conductivity type and having a greater resistivity than said second layer;

(b) forming a plurality of spaced deep base regions by introducing into said first layer, through respective dopant windows, dopant of the opposite conductivity type, and thermally driving said dopant to substantially its full final depth in said first layer;

(c) thereafter forming a common region between adjacent deep base regions by introducing a layer of dopant of said one conductivity type into said first layer and thermally driving said dopant to a depth less than said final depth of said opposite conductivity type dopant, whereby the doping concentration in said common region has a constant value laterally across the region of said first layer which contains said common region;

(d) forming respective shallow base regions laterally aaround the respective lateral peripheries of said plurality of deep base regions and forming a respective source region within each of said respective shallow base regions;

(e) providing a dielectric layer atop said common region and on adjacent portions of said shallow base and source regions;

(f) providing a gate electrode atop said dielectric layer; and

(g) contacting said source regions with electrically conductive materal to form a source electrode.

4,680,854

FORMING LOW RESISTIVITY HILLOCK FREE CONDUCTORS IN VLSI DEVICES

Vu Q. Ho, Kanata; Heinz J. Nentwich, Ottawa, both of Canada, and Hussein M. Naquib, Fremont, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 24, 1985, Ser. No. 812,993

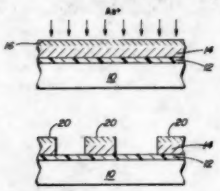
Int. Cl.[4] H01L *21/263, 21/388*

U.S. Cl. 29—576 B **6 Claims**

1. In a method of semiconductor processing, fabricating a conductor by:

depositing on a semiconductor wafer a first layer of aluminum or an aluminum-rich alloy;

depositing on the aluminum a second layer of refractory metal or refractory metal silicide; and



causing interface mixing at an interface between the two layers by implanting ions at said interface.

4,680,855

ELECTRONIC DEVICE MANUFACTURING METHODS

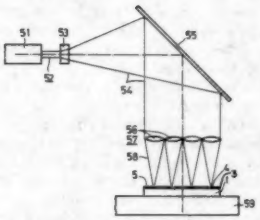
Shunpei Yamazaki; Kenji Itoh, and Susumu Nagayama, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Oct. 28, 1985, Ser. No. 791,733

Claims priority, application Japan, Oct. 29, 1984, 59-227498; Oct. 29, 1984, 59-227499

Int. Cl.⁴ H01L *21/302, 21/461*

U.S. Cl. 29—583 **18 Claims**



9. A method for the manufacture of an electronic device which is provided with at least a patterned non-single-crystal semiconductor layer, comprising the steps of:

forming a non-single-crystal semiconductor layer member; and

exposing the non-single-crystal semiconductor layer member to irradiation by one or more linear pulsed laser beams having a wavelength of 400 nm or less and a duration of 50 nano-seconds or less and having optical energy greater than the optical band gap energy of the non-single-crystal semiconductor layer member, thereby forming the patterned non-single-crystal semiconductor layer.

4,680,856

PROCESS FOR FORMING AN ACOUSTIC MONITORING DEVICE

Hugo Zuccarelli, Corso Roma, 35, 15059 Monleale (AL), Italy

Continuation of Ser. No. 591,714, Mar. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 313,027, Oct. 19, 1981, abandoned. This application Jan. 6, 1986, Ser. No. 816,211

Int. Cl.⁴ H04R *31/00*

U.S. Cl. 29—594 **6 Claims**

1. A process for forming an acoustic monitoring device shaped like a human head for sound sensing, said process comprising the steps of:

(a) applying a first molding material to a human head to form a first mold thereof, such application being done in segments to provide said first mold in segments,

(b) removing said first mold segments from the human head;

(c) assembling said first mold segments to form a full head mold;

(d) applying a second material to said full head mold to form a full head casting of the human head;

(e) removing said full head casting from said full head mold;

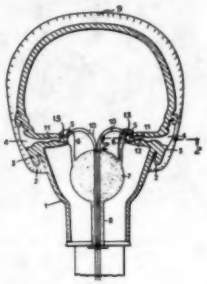
(f) applying a further molding material to said full head casting to form a second mold, such application being done in segments to provide said second mold in segments;

(g) removing said second mold segments from said head casting;

(h) applying to each of said second mold segments a liquid material dryable to a resilient solid material;

(i) allowing the liquid material to dry to form a set of resilient casting segments of the human head;

(j) providing within a human skull model a resilient member



simulating the density, resiliency and consistency of the human brain of the human head;

(k) forming within said human skull model a plurality of members simulating the cartilage, Eustachian tubes, nasal cavities and the oral cavity of the human head;

(l) placing a pair of pressure-sensitive membranes within said skull model at positions simulating the auditory organs of the human head;

(m) coupling said membranes to electrical connections by means responsive to pressure on said membranes, for generating electrical signals representing sensed pressures, including monitored acoustic pressures; and

(n) transferring said set of resilient casting segments from said second mold segments to the exterior of said skull model to simulate the exterior of the human head.

4,680,857

WINDING METHOD

Edward R. Lintott, London, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 14, 1986, Ser. No. 863,195

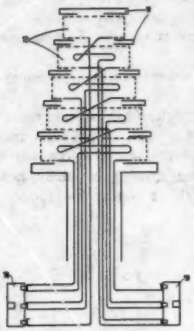
Claims priority, application United Kingdom, Jun. 18, 1985, 8515351

Int. Cl.⁴ H02K *15/08*

U.S. Cl. 29—596 **2 Claims**

1. A method of winding the coils of a stator structure of an electromagnetic device of the kind in which the stator structure is of cylindrical form and defines a plurality of axially spaced pole pieces, adjacent pole pieces defining grooves therebetween, the coils being located in the grooves respectively and in use being supplied with electric current by way of a pain of coil end connections connected to a pair of supply terminals at one end of the stator structure, the method comprising laying the wire forming a first connections to a coil in a slot extending from said one end of the stator structure, winding the coil in the groove furthest from said one end of the stator structure, taking the lead out portion of the wire forming the completed coil into the next adjacent groove and winding

at least one turn before returning the wire along the slot, thereby forming a second connection, to said one end of the



stator structure, and repeating the above steps until all the grooves have coils wound therein.

4,680,858

METHOD OF MANUFACTURE OF STRAIN GAUGES

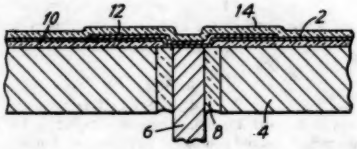
Harvey R. Johnson, Suffolk, England, assignor to Strain Measurement Devices Limited, England

Division of Ser. No. 578,218, Feb. 8, 1984, Pat. No. 4,633,212. This application Jul. 17, 1986, Ser. No. 886,357

Claims priority, application United Kingdom, Feb. 9, 1983, 8303555

Int. Cl.[4] H01C *17/06*

U.S. Cl. 29—610 SG 7 Claims



1. A method of manufacturing an electrical strain gauge comprising a metallic substrate having apertures passing through it, said method comprising the steps of;

(i) securing conductor leads in said apertures with insulating material surrounding the leads to isolate them from the substrate,

(ii) polishing smooth a surface of said substrate to which ends of the leads extend and thereby making said ends flush with said surface,

(iii) depositing and bonding to said surface of the metallic substrate a layer of an electrically insulating material, said layer leaving exposed said ends of the leads,

(iv) applying and bonding to the insulating layer a thin-film deposit to provide a strain-sensitive electrical circuit element overlying and in electrical contact with said ends of the leads,

(v) applying a protective layer over the circuit element.

4,680,859

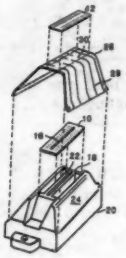
THERMAL INK JET PRINT HEAD METHOD OF MANUFACTURE

Samuel A. Johnson, Eagle, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 860,294, Dec. 6, 1985, abandoned. This application Oct. 3, 1986, Ser. No. 915,292

Int. Cl.[4] G01D *15/16;* H05B *3/00;* B05D *5/12;* G03C *5/00*

U.S. Cl. 29—611 3 Claims



1. A process for fabricating a thermal ink jet printhead assembly which includes the steps of:

(a) providing a thin film resistor structure having a common ink feed opening therein and a plurality of resistive heater elements spaced around the periphery of said opening,

(b) bonding a plurality of conductive leads into electrical contact with said resistive heater elements at the surface of said thin film resistor structure,

(c) affixing an orifice plate to the surface of said thin film resistor structure, and

(d) bonding said thin film resistor structure to an insulating header having an ink feed opening therein of dimensions corresponding to the dimensions of said ink feed opening in said thin film resistor structure, whereby ink may be fed through both of said openings in said header and said thin film resistor structure, respectively and into reservoir cavities in said orifice plate, and ink in said reservoir cavities may be heated from energy from said resistive heater elements and caused to expand through openings in said orifice plate during and ink jet printing operation.

4,680,860

APPARATUS FOR DISASSEMBLING LOCKS

John C. Detloff, Richmond, Va., assignor to A-1 Security Manufacturing Corp., Richmond, Va.

Filed Aug. 4, 1986, Ser. No. 892,269

Int. Cl.[4] B23P *19/04*

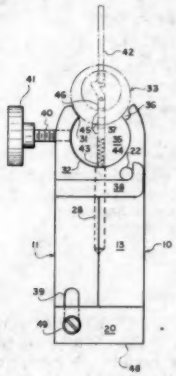
U.S. Cl. 29—804 7 Claims

1. Apparatus for holding a removable core, and receiving pin chamber components extruded therefrom, said apparatus comprising:

(a) a lower member having a flat bottom surface, opposed parallel flat side surfaces rising perpendicularly from said bottom surface, a flat upper surface in parallel disposition to said bottom surface, forward and rear extremities, each extending between said side surfaces, a first series of parallel troughs of uniform semi-circular cross sectional configuration recessed within said upper surface and perpendicularly oriented to said forward and rear extremities, a first elongated recess of cylindric contour extending between said side surfaces adjacent said forward extremity and communicating with said first series of troughs, first pivot means disposed adjacent said rear extremity above said upper surface in perpendicular relationship to said side surfaces, and latch holding means associated with said side surfaces adjacent said forward extremity, and

(b) an upper member having a flat bottom surface adapted to lie in abutting contact with the upper surface of said lower

member, opposed parallel flat side surfaces perpendicularly disposed to said bottom surface and disposed in coplanar relationship with the side surfaces of said lower member, forward and rear extremities adapted to lie directly above the corresponding extremities of the lower member, a second series of troughs shaped and spaced in a manner to meet with the first series of troughs to form circular cylindrical retaining chambers, a second elongated recess configured to meet with said first recess to form a core-receiving channel of cylindric contour whose



cross-section comprises a least 180 degrees of circular arc, said arc being symmetrically disposed about said retaining chambers, said channel having an elongated slot which opens upon the forward extremities of said upper and lower members, locking means adjacent the forward extremity in communication with said second elongated recess, latch means interactive with the latch holding means of the lower member, and second pivot means interactive with said first pivot means to enable the upper member to swing in a vertical path and slide in a horizontal plane with respect to said lower member.

4,680,861

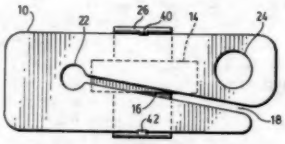
SEATBELT CUTTER

Wilhelm K. Meurer, 65 Wynford Heights Cres., Apt. 2005, Don Mills, Ontario, M3C 1L7, Canada

Filed Apr. 9, 1985, Ser. No. 721,454

Int. Cl.[4] A47F *5/08*

U.S. Cl. 30—296 A **5 Claims**



1. Device for cutting and severing seatbelts and restraint harnesses to free the occupant thereof in case of emergency, said device comprising:

a generally flat body portion having a hand grip area;

an open ended elongated slit therein, said slit being dimensioned in both length and width so as to receive a seatbelt edgewise for cutting purposes;

a blade having a cutting edge disposed in said elongated slit, the cutting the edge thereof being disposed within the thickness of the flat body portion; said cutting edge of the blade also forming an oblique angle with the side walls of the slit;

a holder for releasably receiving said body portion therein, said holder including:

a base having an exterior surface for the disposition of an adhesive material for the releasable attachment of said base to a surrounding support structure;

releasable retension means to maintain said flat body portion in a stored position, such that said hand grip area is exposed from and spaced from said holder, to facilitate the gripping of said hand grip area for rapid release, said releasable retension means including a pair of arms cooperating with said holder to define a generally U-shaped in cross-section, the said arms thereof being integral with the said base and spaced apart a sufficient distance to receive the body portion as a releasable snap fit therebetween, and;

elongate ribs protruding from said base and adapted to receive said body portion thereagainst, in a position spaced away from the interior surface of the base.

4,680,862

MOTOR-DRIVEN CHAIN SAW

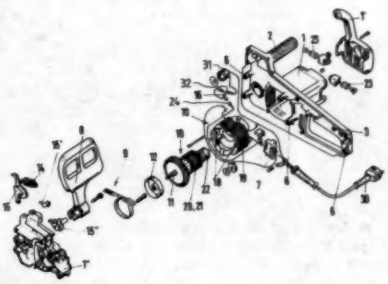
Dieter Wieland, Remseck; Abou Aly, Waiblingen, and Hartmut Riess, Weinstadt, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,746

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530685

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—381 **7 Claims**



1. A motor-driven chain saw comprising:

a housing;

a guide bar mounted on said housing for accommodating a saw chain thereon;

an electric series motor mounted in said housing for driving the saw chain, the series motor including a rotor winding and a field winding having at least two pole coils;

current supply means for supplying current to said series motor; and,

switching circuit means movable between a first position for connecting said rotor winding and said pole coils in series to said current supply means and a second position for disconnecting said supply means from said motor and reversing the polarity of one of said pole coils and short-circuiting said one pole coil across said rotor winding thereby developing a counter torque for braking the coasting movement of the saw chain.

4,680,863

HAND SAWS

Thomas F. Duffy, Box 320, R.D. 1, Owego, N.Y. 13825

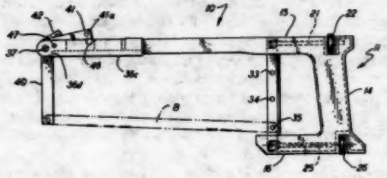
Filed Jul. 9, 1985, Ser. No. 753,125

Int. Cl.[4] B21D *39/00*

U.S. Cl. 30—511 **10 Claims**

1. In a hand saw frame haing a rigid upper frame member, hand grip means, and adjustable blade retaining means affixed

to a proximal end of said upper frame member, the improvement comprising a plurality of individual fingers of differing lengths pivotally journalled at the distal end of said upper frame member, each individual finger pivotable between a



storage position in which it extends substantially parallel to said upper frame member and an operating position in which it extends substantially perpendicular to said upper frame member, each of said individual fingers carrying a pin to engage the end of a saw blade.

4,680,864

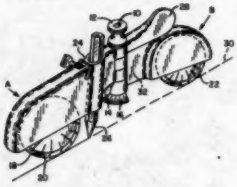
DRAWING GUIDE

Michael S. Heagerty, 15133 Brackett Creek Rd., Bozeman, Mont. 59715

Filed Sep. 26, 1986, Ser. No. 911,887

Int. Cl.[4] B43L *9/00*; G01B *3/12*

U.S. Cl. 33—26 **10 Claims**



1. A drawing guide comprising a narrow upstanding first body part having a single wheel with all but its lower portion enclosed therein, a second narrow upstanding body part having a single wheel with all but its lower portion enclosed therein, said wheels adapted to contact a surface to be marked, said second body part forming a handle to be grasped by one hand of the user, a vertical hinge pivotally interconnecting said two body parts, a marker holder in said first body part between its wheel and said hinge for holding a marker to mark said surface, and a narrow horizontally elongated guide lever on said first body part overhanging said second body part so as to be included in the user's grasp of said second body part.

4,680,865

APPARATUS FOR CHECKING LINEAR DIMENSIONS

Franco Danielli, Zola Predosa, and Sergio Solaroli, Bologna, both of Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

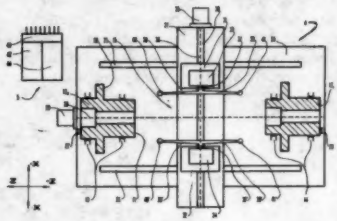
Filed Mar. 5, 1986, Ser. No. 836,416

Claims priority, application Italy, Apr. 1, 1985, 3386 A/85

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—143 L **16 Claims**

1. An apparatus for checking dimensions of mechanical parts, comprising: support means; first and second reference means arranged in positions substantially fixed with respect to the support means, for mechanically positioning first and second mechanical parts; measuring means coupled to the support means for checking both the first and the second parts, the measuring means including a first slide movable on the support means, a second slide and a third slide, both movable on the first slide, first and second sensing means arranged on the second and third slides respectively and transducer means adapted to detect the positions of the first, second and third slides, the first and second sensing means being adapted to be arranged in positions substantially mutually symmetrical with



respect to the first and second reference means; and driving and control means adapted to cause displacements of the measuring means for achieving positioning of the measuring means with respect to the first and second parts.

4,680,866

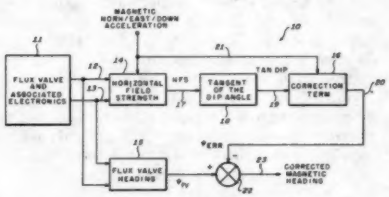
MAGNETIC FLUX DETECTOR CORRECTION SYSTEM

James S. Johnson, and Gene A. Albrecht, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1985, Ser. No. 811,066

Int. Cl.[4] G01C *17/38*

U.S. Cl. 33—356 **6 Claims**



1. An aircraft heading correction system of the type utilizing a magnetic flux detector to provide a signal as a function of magnetic heading of said aircraft, said correction system comprising:

a first means, configured to accept:

(a) a signal representative of north, east and down acceleration components of said aircraft,

(b) said signal as a function of magnetic heading of said aircraft, for providing a signal representative of horizontal field strength,

a second means, configured to accept said signal representative of horizontal field strength, for providing said signal representative of horizontal field strength and a signal representative of the tangent of a dip angle,

a third means, configured to accept said signal as a function of magnetic heading of said aircraft, for providing a magnetic heading signal,

a fourth means, configured to accept:

(a) said signal representative of horizontal field strength,

(b) said signal representative of the tangent of a dip angle,

(c) said signal representative of north, east and down acceleration components of said aircraft, for providing a magnetic heading correction signal, and

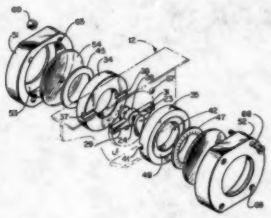
a fifth means, configured to accept said magnetic heading correction signal and said magnetic heading signal for providing a corrected magnetic heading signal.

4,680,867

LEVEL WITH DUAL POINTERS

Marie C. Hufman, and Norman C. Hufman, both of Rte. 1, Box 11, both of Blanca, Colo. 81123

Filed Aug. 21, 1986, Ser. No. 898,655
Int. Cl.[4] G01C 9/12
U.S. Cl. 33—391 10 Claims



1. A level comprising:

a frame having spaced parallel straight edges and having a transverse opening between said edges,

a pair of depending pointers on the ends of a transverse rotary shaft disposed in said opening,

mounting means for supporting said shaft for free rotation in said opening, said mounting means including a central hub portion centered midway between said pointers supporting a single center bearing centered in said hub portion midway between said pointers, a pair of coaxial supports for said hub portion that separate along a parting line midway between said pointers and fastening means for releasably securing said supports to said frame with said supports extending out from opposite sides of said frame, and

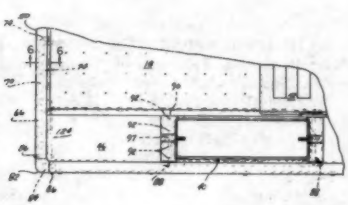
a calibrated scale for each pointer, said scales being disposed on opposite sides of said frame, each scale including calibration lines and numeral indicators to indicate the angle of inclination of the pointer to said straight edges when the frame is between horizontal and vertical positions.

4,680,868

COORDINATE MEASURING MACHINE WITH COVERS

Ladd J. Orr, and John J. Tuss, both of Englewood, Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 7, 1986, Ser. No. 882,573
Int. Cl.[4] G01B 5/03
U.S. Cl. 33—503 9 Claims



1. A coordinate measuring machine (10) of the type including a base (30) having generally vertically extending sides defining a base perimeter, a table (14) fixed to the top of the base (30) said table (18) having a horizontal planar surface (18), a bridge (28) mounted for guided horizontal movement on said base (30) along a first axis, said bridge (28) including a pair of vertical upstanding members (40) each having a lower portion extending alongside a respective opposite side of said base (30), said upstanding members extend above and below the level of said planar surface (18) of said table (14), an upper cross member (26) connecting the upper ends of said upstanding members (40), a carriage (24) supported for movement on said upper cross member (26) along a second horizontal axis orthogonal to said first axis, and a probe (12) mounted for guided vertical movement on said carriage (24), the improvement comprising:

vertically extending cover means;

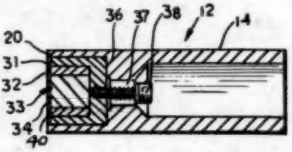
at least in part extending around the side of said base (30) and said table (14); including a pair of panels comprising side covers (42) mounted to a respective side of said base (30) spaced away from the side of said table (14) and base (30) beyond the outer lower portions of said upstanding member to establish an elongated horizontal opening (44) on said opposite sides of said table (14) and base (30), lying between said table (14) and each side cover (42) through which said upstanding members (40) move as said bridge (28) moves along said first horizontal axis.

4,680,869

CYLINDRICAL SQUARE

David Murkens, 724 Park Ave., Meadville, Pa. 16335

Continuation-in-part of Ser. No. 732,922, May 13, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 899,805
Int. Cl.[4] G01B 5/24
U.S. Cl. 33—533 2 Claims



1. In combination, a cylindrical gauge and a horizontal surface to be checked by said cylindrical gauge and a gauge support,

said cylindrical gauge having a cylindrical hollow gauge body having a partition therein with a central hole through said partition having a first precision flat end and a second end,

said cylindrical gauge body having a precision cylindrical outside surface perpendicular to said first end surface extending from said first end to said second end,

said gauge support having a vertical surface and a horizontal surface,

an indicator support having a flat horizontal surface and a sensing element,

said indicator support being adapted to have its said flat surface rest on said horizontal surface,

said gauge support being made of magnetic material,

said cylindrical gauge having a cylindrical permanent magnet means in said hollow gauge body adjacent said first end,

said permanent magnet means comprising a first hollow cylinder made of magnetic material having a first end and a second end,

a second hollow cylinder made of non-magnetic material having a first end and a second end,

a cylindrical permanent magnet having a first end and a second end,

said hollow cylindrical gauge body, said first hollow cylinder, said second hollow cylinder, and said permanent magnet being disposed concentric to each other,

said first hollow cylinder receiving said second hollow cylinder,

said second hollow cylinder receiving said cylindrical permanent magnet,

said first end of said first hollow cylinder, said first end of said second hollow cylinder and a said end of said permanent magnet being disposed in a common plane,

said common plane being spaced inward of said first end of said cylindrical gauge body,

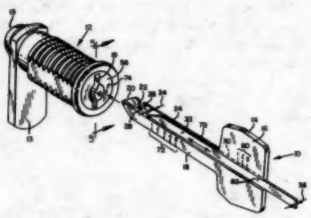
a screw extending through said central hole in said partition,
means on said second end of said permanent magnet means engaging said screw whereby said magnet means is held rigidly to said partition,
holding said permanent magnet means in spaced inwardly relation to a plane disposed on said first precision flat end of said cylindrical gauge body providing a space for foreign material to be received between said first end of said permanent magnet means and said vertical surface of said gauge support,
said cylindrical outside surface being adapted to be held parallel to said horizontal surface by said permanent magnet means,
said indicator support being adapted to be moved over said horizontal surface with said indicator sensing element in contact with the upper edge of said precision cylindrical outside surface whereby the accuracy of said angle between said horizontal surface and said vertical surface is checked by said indicator.

4,680,870

DEVICE AND METHOD FOR DECODING CYLINDER LOCKS

T. Doyle McConnell, 15834 NE. Glisan, Portland, Oreg. 97230

Filed Oct. 14, 1986, Ser. No. 918,529
Int. Cl.[4] G01B 5/20
U.S. Cl. 33—540 **11 Claims**



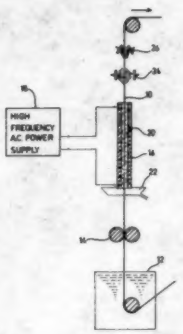
1. A device for decoding a cylinder lock of the type including a plurality of tumblers movable within a cylinder of the lock by a key having the correct profile, to determine the depth of cut required on a key for each tumbler position for such a lock, comprising:
(a) a main body including an elongate shank adapted to fit within the keyhole of the lock and handle means attached to said shank for manipulating said shank;
(b) an elongate feeler adapted to slide along said shank and including means for engaging a tumbler of said lock;
(c) said shank and said feeler having a combined thickness small enough for said shank and said feeler to fit together within said keyhole of said lock;
(d) means for defining a notch in said shank for holding a single tumbler, in a normal locking position, within said notch;
(e) first indicia means located on said shank for showing which of said plurality of tumblers is aligned with said notch; and
(f) second indicia means located on said main body and said feeler for cooperatively showing the position of said feeler relative to said notch.

4,680,871

APPARATUS AND METHOD FOR DRYING AND CURING COATED SUBSTRATES

David Reznik, 2151 Barbara Dr., Palo Alto, Calif. 94303

Filed May 17, 1985, Ser. No. 735,366
Int. Cl.[4] F26B 3/347
U.S. Cl. 34—1 **16 Claims**



1. In an apparatus for drying and/or curing solvent containing coatings on a conductive substrate which comprises:
means for inductively heating the coated substrate in a highly confined space, producing vapors; and the improvement which comprises providing means for recovery of the solvent and thereby simultaneously preventing atmospheric pollution by avoiding incineration of the vapors produced and/or venting them or the incineration products to the atmosphere, characterized by:
cooling means for condensing evaporated liquids released as a result of the heating, which cooling means is disposed around the periphery of the substrate in said highly confined space; and
means for removal of the resulting condensed liquids, and wherein said means for inductively heating comprises an AC electrical power supply and an induction coil coupled to the power supply and arranged in close physical proximity to the substrate to be dried and/or cured,
said induction coil being arranged to define a conduit for the flow of coolant therethrough, whereby said coil, thus cooled, operates as a condenser for the evaporated liquid, thus forming at least part of said cooling means for condensing.

4,680,872

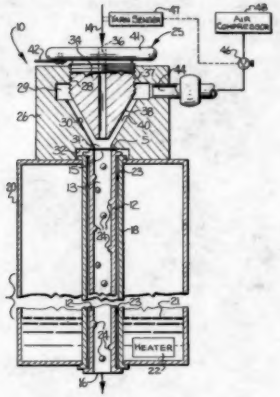
YARN HEATING APPARATUS AND METHOD

Karl Bauer, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,257
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507642; Apr. 25, 1985, 3514874
Int. Cl.[4] F26B 13/02
U.S. Cl. 34—23 **15 Claims**

1. A yarn heating apparatus adapted for the continuous heat treatment of a running synthetic yarn in a yarn processing machine and the like, and compromising
a yarn guide tube through which a running yarn is adapted to be conducted, with said tube closely surrounding the yarn so as to guide the yarn along a substantially straight path, and with said tube defining a yarn entry end and a yarn exit end,
means for heating the yarn guide tube so as to heat the running yarn as it is conducted therethrough, and
air supply means for positively introducing air at ambient temperature into said yarn guide tube adjacent the entry end thereof and so as to produce turbulence in the air as it

moves through said tube and thereby improve heat transfer between said tube and the running yarn, said air supply means including a source of pressurized air at ambient



temperature, and air duct means operatively connected to said source of pressurized air and which communicates with the path of the running yarn at an inclined angle.

4,680,873

METHOD FOR CONTROLLING SHRINKAGE AND/OR STRETCHING OF A PAPER WEB IN THE DRYING SECTION OF PAPER MACHINE, IN THE FORM OF A CYLINDER DRIER AND/OR FAN DRYER, TRANSVERSELY TO THE FEED DIRECTION OF THE WEB AND ARRANGEMENTS FOR CARRYING OUT THE METHOD

Christer Fellers, Sollentuna; Myat Htun, Vällingby, and Torbjörn Hansson, Stockholm, all of Sweden, assignors to Flakt AB, Stockholm, Sweden

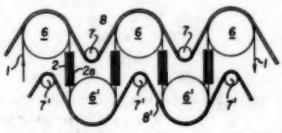
PCT No. PCT/SE85/00068, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/03534, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 11, 1985, Ser. No. 787,806

Claims priority, application Sweden, Feb. 9, 1984, 84-00678

Int. Cl.[4] F26B *13/08*

U.S. Cl. 34—116 **45 Claims**



1. A method for controlling or regulating shrinkage and/or stretching of a paper web transversely to its transport direction in a drying section of a paper machine, said drying section having the form of a cylinder dryer and/or a fan dryer, characterized by subjecting the paper web to an outwardly directed force beginning at that point in the drying process where the paper web exhibits a dry solids content of at most 75%, and causing said force to act in the edge portion of the paper web.

4,680,874

DEVICE FOR EXTRACTING WATER FROM A LOAD OF WASHED ARTICLES

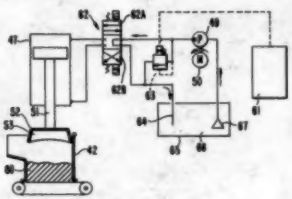
Shoichi Hayashi; Hidetoshi Ishihara; Taketoshi Okada, and Kunio Kojima, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Churyo Engineering Co., Ltd., Aichi, both of, Japan

Filed Jun. 3, 1986, Ser. No. 869,899

Claims priority, application Japan, Jul. 26, 1985, 60-114999[U]; Sep. 18, 1985, 60-204524; Sep. 27, 1985, 60-147910[U]

Int. Cl.[4] F26B *9/04*

U.S. Cl. 34—143 **4 Claims**



1. A device for extracting water from a load of washed articles, said device comprising:

a basket in which the load is confined;

fluid pressure exerting means employing fluid pressure for causing the fluid pressure to exert pressure on the load confined within said basket for extracting water therefrom; and

a control system operatively connected to said fluid pressure exerting means for controlling the fluid pressure exerted by said fluid pressure exerting means on the load of washed articles confined within the basket,

said control system causing said fluid pressure exerting means to initially exert a first low pressure on the load for a predetermined period of time, and said control system causing said fluid pressure exerting means to exert a second pressure on the load that is higher than said first pressure after said predetermined period of time has elapsed,

said first pressure being at the most approximately 0.5 kg/cm^2 in order that the load of washed articles be preliminary compressed at said first low pressure during initial extraction of water from the load over said predetermined period of time to prevent damage to the articles by water and any air trapped in the load.

4,680,875

DIVERSIFIABLE COMPLIANCE SOLE STRUCTURE

Diego Danieli, Caerano S. Marco, Italy, assignor to Calzaturificio F.lli Danieli S.p.A., Caerano S. Marco, Italy

Filed May 8, 1985, Ser. No. 731,709

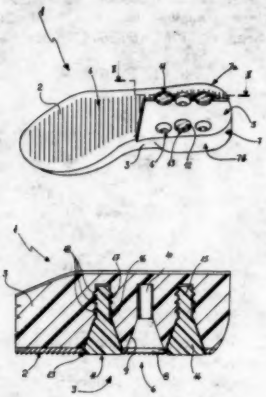
Claims priority, application Italy, May 18, 1984, 30738/84[U]

Int. Cl.[4] A43B *13/14*

U.S. Cl. 36—31 **10 Claims**

1. A diversifiable compliance sole structure having in combination therewith a plurality of plugs, said sole structure comprising a sole, a treading surface, a sole element and a plurality of seats, said sole defining at least one bottom face and at least one top face, said treading surface being formed on said at least one bottom face of said sole, said sole element being bonded, to said at least one top face of said sole, each seat in said plurality of seats being formed in said sole structure and having at least a first substantially cylindrical zone, a second substantially conical zone, and a third substantially cylindrical zone, each plug in said plurality of plugs having a first substantially cylindrical plug zone, a second substantially conical plug zone and a third substantially cylindrical plug zone, each of said plugs being selectively, removably insertable in at least one of said seats, said first substantially cylindrical zone of said seat being

adapted for removably accommodating at least a portion of said first substantially cylindrical plug zone of at least one of said plugs, said second substantially conical zone of said seat, being adapted for interconnecting said first and third substantially cylindrical zones thereof and for selectively removably accommodating said second substantially conical plug zone of



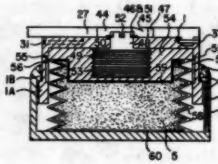
at least one of said plugs, said third substantially cylindrical zone of said seat being adapted for selectively removably accommodating said third substantially cylindrical plug zone of at least one of said plugs, said second substantially conical plug zone of each of said plugs being adapted for interconnecting said first and third substantially cylindrical plug zones thereof.

4,680,876

ARTICLE OF FOOTWEAR

Koh K. Peng, Jalan C. 10, Taman Melawati, Setapak, Kuala Luppur, Malaysia

Filed Nov. 21, 1984, Ser. No. 673,610
Int. Cl.[4] A43B *21/28, 21/26, 21/22*
U.S. Cl. 36—35 B **17 Claims**



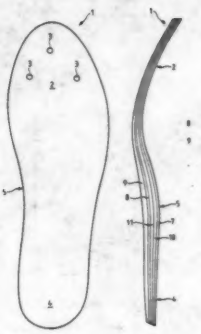
1. An article of footwear comprising a ground-engaging part comprising upper and lower components, limit stop means associated with said components to define limit stop positions between which said components are capable of limited movement toward and away from one another, a spring medium between said components, a compression element movable relative to one of said components independently of the limit stop means, an adjustable member which is rotatable but not axially displaceable relative to said one component and means operatively connecting the adjustable member and the compression element whereby rotation of the adjustable member displaces the compression element toward or away from said one component thereby to vary the rate of the spring medium without altering said limit stop positions between which the components are relatively movable by, or against the action of, the spring medium.

4,680,877

SHOE INSOLE

Hans Fink, Möhlin, Switzerland, assignor to Bata Schuh AG, Mohlin, Switzerland

Filed Jun. 26, 1985, Ser. No. 748,832
Claims priority, application Switzerland, Jul. 2, 1984, 3176/84
Int. Cl.[4] A43B *13/38, 7/06*
U.S. Cl. 36—44 **5 Claims**



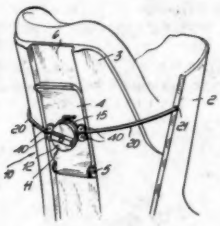
1. A Shoe insole particularly for use in a sports shoe comprising a plurality of layers including a first layer of tough, wear - resistant wood material having a first specific gravity and a second layer of wood material having a second specific gravity which is lower than said first specific gravity, said second wood material being more compressible than said first wood material, and comprising at least one layer of said second wood material between two layers of said first wood material, and means for firmly interconnecting said layers.

4,680,878

SKI BOOT

Alessandro Pozzobon, Treviso, and Giorgio Baggio, San Martino di Lupari, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Apr. 28, 1986, Ser. No. 857,037
Claims priority, application Italy, May 6, 1985, 20575 A/85
Int. Cl.[4] A43B *5/04;* **A43C** *11/00*
U.S. Cl. 36—117 **17 Claims**



1. In a ski boot defining a longitudinal direction thereof, a widthwise direction thereof and an upwards direction thereof and having a boot shell, attached to the boot shell a first gaiter and a second gaiter opposite to said first gaiter, a gaiter closure device comprising:

a lever member having a fist face on one side thereof and a second face on an opposite side thereof,

an articulation area on said first gaiter, articulation means on said articulation area defining an axis of rotation extending substantially parallel to said articulation area,

said lever member being articulated on said articulation area by said articulation means rotatable about said axis of

rotation from a closing position in which said lever faces said articulation area with said first face thereof to an opening position in which said lever faces said articulation area with said second face thereof,

a tension adjusting mechanism having a coiler member arranged on said lever member in an intermediate position thereof and in front of said first face thereof and having a coiling axis extending transverse thereto,

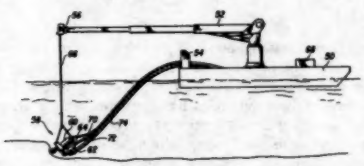
cable means having a first portion thereof directly in unreleasable connection with said second gaiter and a second portion thereof directly in unreleasable connection with said coiler member and guide means for said cable means, said coiler member having actuation means conected therewith to operate winding and unwinding of said cable means around said coiler thereby to tension and alternatively slacken said cable means upon actuation of said actuation means.

4,680,879

UNDERWATER DREDGING APPARATUS AND CUTTER HEAD THEREFOR

Charles E. Hill; Edwin L. Hill, and Ernest W. Hill, all of Virginia Beach, Va., assignors to PJH, Inc., Norfolk, Va.

Filed Jun. 28, 1985, Ser. No. 749,864
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—67 **11 Claims**



1. A dredging apparatus for moving material from a water bottom, said apparatus comprising:

means for dislodging material at said water bottom;

means for sucking said dislodged material into and propelling said dislodged material through a discharge conduit; and

means for supporting and positioning said dislodging means and said sucking and propelling means in proximity to said water bottom, said supporting means comprising boom means, pivotally mounted on a support vehicle for movement about a vertical axis, cable means attaching said dislodging means and said sucking and propelling means to a distal end of said boom means, said boom means including means for extending and retracting said distal end in a radial direction with respect to said vertical axis, whereby said dredging apparatus can remove a layer of bottom material by means of pivotal and radial movements of said boom means without repositioning said support vehicle, wherein said dislodging means comprising a submersible electric motor; cutter head means; and shaft means interconnecting said electric motor and said cutter head means, said cutter head comprising:

a support means having two ends mountable on said rotating shaft, and extending along an axis of rotation of said rotating shaft said support means including a support member extending outwardly of said support means at one end;

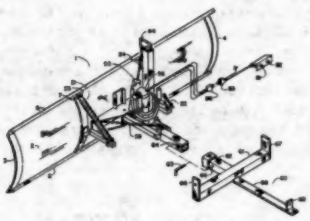
a plurality of blade means, each of said blade means having two ends with one of said blade means ends attached to said support member outwardly of said support means and the other of said blade means ends attached directly to the other of said support means ends, wherein each of said blade means includes a mid portion between said blade means ends and said mid portion extends radially outwards of said axis of rotation and said blade means ends attached to said support member are further from said axis of rotation than said blade means end attachment on said support means.

4,680,880

SNOW PLOW FOR SMALL VEHICLES

Louis Boneta, Eagle River, Ak., assignor to Moose Industries, Inc., Anchorage, Ak.

Filed Feb. 28, 1986, Ser. No. 834,372
Int. Cl.[4] E01H *5/06*
U.S. Cl. 37—236 **10 Claims**



1. A snow plow comprising:

A. a blade;

B. frame means for attaching said snow plow to said vehicle;

C. a mounting yoke fixedly attached to said blade;

D. a swing arm removably attached to said mounting yoke, thereby forming an integral assembly with the blade and mounting yoke;

E. a pedestal, said pedestal having a vertical component and a horizontal component, said vertical component forming a compressed air storage tank, said horizontal component being purpendicularly connected to said vertical component and having a first set of connecting holes therein being used to removably attach said pedestal to said swing arm, and a second set of connecting holes being used to attach said pedestal to said frame means;

F. pneumatic lifting means fixedly attached to swing arm such that said lifting means act to pivotably raise or lower said swing arm, and therefore, the blade, longitudinally about the pedestal;

G. compressor means attached to said pedestal;

H. valve means connected to said pedestal to permit proper flow of air to the pneumatic lifting means;

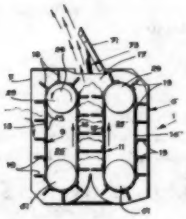
I. control means to operate said compressor and valve means.

4,680,881

SNOW BLOWER WITH SNOW CHANNEL OF VERTICAL SCRAPER SNOW BELTS

Richard Cloutier, 23, rue Langevin, Bois Briand, Quebec, Canada (J7E 4H5)

Filed May 20, 1986, Ser. No. 864,877
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—237 **12 Claims**



1. A snowblower comprising:

a casing having a generally rectangular opening;

a front and a rear endless travelling belt and means mounting said belts vertically and in parallel relationship one behind the other, on and within said casing; each belt defining a forward strand and a rearward strand with respect to said opening; said belts being spaced apart and defining a vertical channel therebetween, said rearward strand of said front belt facing said forward strand of said rear belt in said vertical channel;

snow scraper members fixed to and projecting perpendicularly away from said belts, transversely thereof;

means driving said belts into endless travel at equal speeds and in reverse directions with respect to one another and with said forward strand of said front belt moving downwardly, and

wherein said snow scraper members are spaced at predetermined intervals, from one another, said intervals being selected so that said snow scraper members of one belt are aligned in pairs with said snow scraper members of the other belt when moving along said channel.

4,680,882

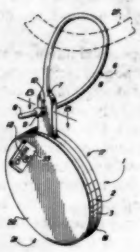
IDENTIFICATION TAG

Jesse E. Watson, Jr., 710 N. Main, Homer, La. 71040

Filed Dec. 23, 1985, Ser. No. 812,768

Int. Cl.[4] G09F *3/20*

U.S. Cl. 40—5 **22 Claims**



1. An identification tag for attachment to an article, comprising substantially flat base tag means; attachment means extending from said base tag means for securing said base tag means to the article; a first plurality of apertures provided in a first selected orientation in said base tag means and a second plurality of apertures provided in a second selected orientation in said base tag means; at least one indicia space provided on said base tags means; and a first cap located on one side of said base tag means and provided with a first plurality of snaps oriented in registration with said first plurality of apertures and a second cap located on the opposite side of said base tag means and provided with a second plurality of snaps oriented in registration with said second plurality of apertures, and a window in said cap means, whereby when said snaps are provided in registration with said apertures for securing said first cap and said second cap to said base tag means, said window substantially corresponds to said indicia space.

4,680,883

SCROLL MODULE AND SIGN SYSTEM FOR INTERNALLY ILLUMINATED SIGNS

Robert C. Stadjuhar, and Cecil S. Renfro, both of Colorado Springs, Colo., assignors to Skyline Products, Inc., Colorado Springs, Colo.

Filed Jun. 18, 1985, Ser. No. 746,185

Int. Cl.[4] G09F *11/18*

U.S. Cl. 40—471 **27 Claims**

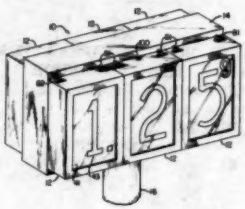
1. A scrolling apparatus for displaying changeable messages and adapted for use as an internally illuminated outdoor sign, comprising:

a box-like framework having a front view area adapted to allow viewing of a selected message;

a pair of rollers journaled for rotation in the interior of said framework and located at opposite sides of said view area on substantially parallel, spaced-apart axes;

a flexible message web having opposite end edges secured to a respective roller and having end portions wound around said rollers whereby an exposed portion of the web extends between rollers across said view area and whereby rotation of the rollers causes the web to be wound from one roller to the other roller to change the exposed portion thereof;

a flexible drive strap having a first end mounted to one of said rollers and a second end mounted to the other of said



rollers and having end portions wound around said rollers whereby rotation of the rollers causes the strap to be wound from one roller onto the other roller, the end portion of the strap on each roller being wound around its respective roller in an opposite circumferential direction than the web, said strap having a width substantially larger than its thickness whereby each end, portion thereof is wrapped and unwrapped directly about itself on its respective roller;

tensioning means on a web drive assembly defined by said rollers and said drive strap for applying a rotational tensioning force to the web whereby the exposed portion of the web is maintained taut under the force of said tensioning means; and

drive means for reverseably driving the drive assembly to wind the web from one roller to the other roller.

4,680,884

SAFETY FIREARM MECHANISM

Forrest P. Smith, Jr., 35 Gilpin Ave., Hauppauge, Long Island, N.Y. 11787, and Jeffrey C. Munnell, 633 Long Run Rd., McKeesport, Pa. 15132

Filed Jan. 14, 1986, Ser. No. 818,802

Int. Cl.[4] F41C *17/02*

U.S. Cl. 42—66 **13 Claims**

1. A firearm mechanism for use with a single action firearm of the type including a spring biased pivotal hammer, a pivotal

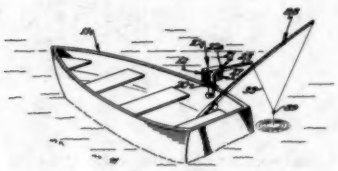
trigger and means interconnecting the trigger and hammer for retaining the hammer in retracted position when manually cocked and releasing the hammer when the trigger is manually pulled, the improvement comprising means preventing firing of the firearm unless the trigger is manually pulled back even though the hammer may accidentally fall forward, said means including a flipper assembly connected with the hammer to prevent movement of the trigger until the hammer is retracted from its at rest position down against the frame, a transfer bar connected to the trigger and movable vertically between the hammer and a firing pin to transfer impact of the hammer to the firing pin when the transfer bar is elevated in response to movement of the trigger to a firing position, said flipper assembly preventing upward movement of the transfer bar to preclude it from being positioned between the hammer and the firing pin whereby the hammer will not impart impact to the firing pin.

4,680,885

FISH JIGGING DEVICE

Allan D. Lindell, R.R. 1, Armstrong, Iowa 50514, and Ronald L. Roalson, 29 W. Kenrue La., Fairmont, Minn. 56301

Filed Oct. 17, 1986, Ser. No. 920,139
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—19.2 **9 Claims**



1. A jigging machine for use in jigging a fishing line comprising:

a housing,

a reversible stepper motor in said housing having an output shaft, said stepper motor, when energized by a signal, rapidly rotating through a single step angle of predetermined magnitude,

a reel mounted on said output shaft of said stepper motor and positioned exteriorly of the housing, an elongate flexible fishing line wound on said reel and having a lure or fishing bait at one end thereof,

generally horizontally disposed guide means mounted on said housing exteriorly thereof and projecting therefrom, said fishing line engaging said guide means and depending therefrom,

electrical circuitry connected to a source of electrical current and including a driver control circuit electrically connected with said stepper motor for controlling operation thereof,

means producing a signal in response to rotation of said stepper motor output shaft through a predetermined angular movement thereof, and

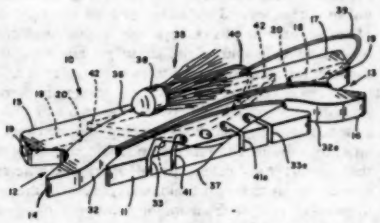
an inverter circuit electrically connected with said driver control circuit and said signal producing means for inverting the signal received from the latter to thereby reverse the operation of rotation of said stepper motor whereby said reel will be rotated in rapid steps and in opposite directions to impart a jigging action to the fishing line and the lure connected to the end thereof.

4,680,886

LEADERED FISHING LURE HOLDER WITH MEANS FOR RECEIVING LEADER AND HOOKS

Joseph M. Caselli, Sr., 2731 NE. 14th St. Causeway, Pompano Beach, Fla. 33062

Filed Feb. 20, 1986, Ser. No. 831,486
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.1 **6 Claims**



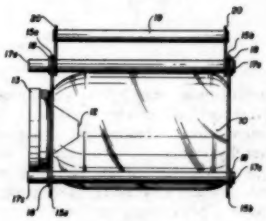
1. A universal holder for the safe and convenient storage of a leadered fishing lure comprising an elongate flexible leader having an end loop at one end thereof for attachment to a fishing line and having a fish-attracting lure with at least one fish hook having a pointed end at the free end thereof, said holder comprising an elongate, narrow, rigid, water-resistant body having opposed ends, a longitudinal central notch formed inwardly from each of said ends to provide extensions of said body at both sides of said central notches, at least one of said extensions being provided with at least one longitudinal bore adjacent the notch and extending inwardly from said end to a floor, said bore being designed to receive the pointed end of the fish hook adjacent said floor, said elongate body having elongate side edges, at least one said edge containing an elongate slot designed to receive and hold the pointed ends of additional hooks present on said leadered lure, said elongate slot extending uninterrupted a majority of the length of said edge, said elongate body also containing retainer means for releasably-holding the end loop of the leadered fishing lure, whereby the leadered fishing lure is attachable to said holder by first inserting the pointed end of the hook into said bore at one end of said elongate body, pressing the lure against the side of the elongate body and longitudinally wrapping the flexible leader under tension through the notch at the other end of said body and around said body and notches until the length of the elongated leader is reduced sufficiently to permit the end loop thereof to be releasably-attached to said retainer means.

4,680,887

SUPPORT STAND FOR A MINNOW TRAP

Thomas O. Bergquist, P.O. Box 121, Ceredo, W. Va. 22507

Filed Mar. 25, 1986, Ser. No. 843,676
Int. Cl.[4] A01K *69/00*
U.S. Cl. 43—100 **4 Claims**



1. A minnow trap for catching minnows in a moving stream of water, comprising:

a jar having an enlarged main portion, a large opening at one end and small openings at the opposite end such that when the jar is arranged horizontally in a moving stream of water, the minnows can enter at the large end and water can pass through the openings at both ends,

a support stand for said jar,

said support stand having a pair of generally planar apertured, upright end plates, the aperture in one of said end plates receiving the end of the jar having the large opening and the other end plate engaging the said opposite end of the jar, exposing its said aperture to said small openings in said opposite end of the jar to permit water flowing through the small openings to pass therethrough,

at least three generally parallel and generally horizontal support rods extending between the two end plates and attached thereto, said rods spacing the two end plates apart by a distance to receive said main portion of the jar, the support rods being spaced apart circumferentially around the jar to support said main portion of the jar so as to prevent the jar from moving laterally out from the space between the rods,

the two end plates having lower portions which are lower than the level of the rods to form bottoms which rest on the ground surface,

two of the support rods being lower support rods which form a lower support for the said main portion of the jar, and a third support rod located along the uppermost part of the main portion of the jar,

and including a handle pivotally connected to the third support rod.

4,680,888

HYBRID SEED PRODUCTION IN COMMON WHEAT USING CYTOPLASMIC MALE STERILITY

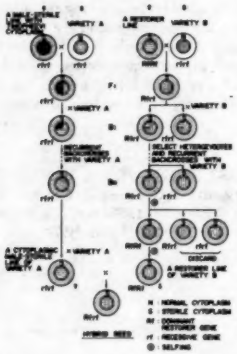
Koichiro Tsunewaki, Kyoto, and Ichiro Ohtsuka, Hiratsuka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Sep. 5, 1985, Ser. No. 772,995

Claims priority, application Japan, Sep. 18, 1984, 59-195580

Int. Cl.[4] A01H *1/02*

U.S. Cl. 47—58 **5 Claims**



1. A method of commercial hybrid wheat production which comprises growing common wheat varieties to which D^2-type cytoplasm derived from Aegilops species has been introduced in a male-sterility inducing environment of not less than 14 hours daylight during the reproductive stage until male sterility is induced, producing hybrid seeds by growing in alternating blocks with a pollinator parent with a good combining ability, maintaining said male-sterile D^2-type alloplasmic lines by self pollination by growing said lines in a male fertility-inducing environment of less than 14-hour day length during the reproductive stage and harvesting after growing said hybrid.

4,680,889

PROCESS FOR TREATING PLANTS

Danis R. Carlson, 708 119th La. N.E., Blaine, Minn. 55434

Continuation-in-part of Ser. No. 792,617, Oct. 22, 1985, which is a continuation of Ser. No. 518,008, Jul. 28, 1983, which is a continuation of Ser. No. 286,260, Jul. 23, 1981. This application Nov. 27, 1985, Ser. No. 802,477

Int. Cl.[4] A01C *1/00*; A01G *1/00*; A01N *43/08*

U.S. Cl. 47—58 **14 Claims**

1. A process for treating plants to increase growth rates, wherein said process comprises applying to a plant an aqueous growth stimulating solution of gibberellin and then subjecting said plant to high frequency sound waves having a frequency of between 4 to 6 kilohertz while said gibberellin solution is disposed on said plant.

4,680,890

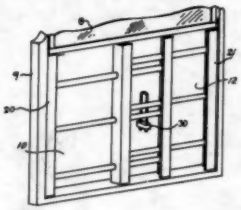
WINDOW INTRUSION BARRIER

Isidore Jokel, 4201 Newport "H" , Deerfield Beach, Fla. 33441

Filed Apr. 21, 1986, Ser. No. 854,428

Int. Cl.[4] E06B *3/68*

U.S. Cl. 49—55 **5 Claims**



1. A barrier apparatus for a vertically adjustable window, the apparatus having an adjustable length adapted for insertion into a window casement below a framed rectangular window slideably positionable within said casement, said barrier apparatus comprising:

(a) a first and a second gridwork panel horizontally spaced in substantially co-planar juxtaposition, said panels comprising rigid rectangular frames adapted to border and support said panels, each frame comprising horizontally disposed upper and lower borders, and inner and outer vertically oriented side borders, said inner borders facing each other, said facing side borders having vertically spaced guide holes;

(b) first and second horizontally directed posts affixed medially between said upper and lower horizontal borders of each panel, said posts affixed to said facing inner side borders and adapted to slideably penetrate said guide holes;

(c) a first elongate member containing a series of positioning apertures of uniform size, said member integrally secured to one of said horizontal posts;

(d) a second elongate member containing a series of positioning apertures of uniform size, said second member integrally secured to the other of said horizontal mating posts, the vertical distance between said aperture series of said first member and said aperture series of said second member being less than two inches; and

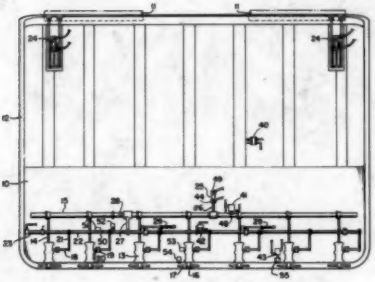
(e) locking means for securing said first horizontal post relative to said second post by the placement of said locking means through a co-aligned pair of positioning apertures of said first and second elongate members respectively.

4,680,891

DOOR HYDRAULIC ARRANGEMENT

John W. Perkins, Hialeah, Fla., assignor to Monarch Aviation, Inc., Miami, Fla.

Filed Jun. 27, 1986, Ser. No. 879,803
Int. Cl.[4] E05F 15/00
U.S. Cl. 49—280 7 Claims



1. A hydraulically-operated mechanical arrangement for sequentially unlocking, unlatching and opening a panel covering an opening in a wall of a structure comprising

latch means for latching said panel to the opening of said structure when said panel is in a closed and latched position and for unlatching said panel when said panel is to be opened

pin means for locking said latch means when said panel is in a closed latched position and for unlocking said latch means when said panel is to be opened

hydraulic pump means for pressurizing a hydraulic fluid

a hydraulic cylinder for disengaging said pin means from said latch means

a latch open sequence valve comprising a first hydraulic switch

a hydraulic cylinder for operating said latch means in an unlatching mode

a panel open sequence valve comprising a second hydraulic switch

a hydraulic cylinder for opening said panel, and

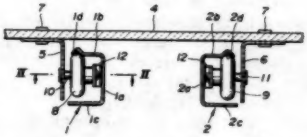
hydraulic conduit connecting said sequence valves and said cylinders to said hydraulic pump means.

4,680,892

DEVICE FOR GUIDING UPWARD AND DOWNWARD MOVEMENT OF WINDOW PANE OF AUTOMOTIVE VEHICLE DOOR

Satoru Ugawa, Hadano, Japan, and Satoshi Obuchi, deceased, late of Fukuoka, Japan (by Fukashi Obuchi, Ruriko Obuchi, legal representatives), assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 12, 1986, Ser. No. 838,815
Claims priority, application Japan, Jul. 8, 1985, 60-149811
Int. Cl.[4] E05D 13/00
U.S. Cl. 49—374 11 Claims



1. A device for guiding upward and downward movement of a window pane of an automotive vehicle door, comprising:

a pair of parallel guide rails each of which is U-shaped in cross-section and has a pair of parallel side walls and a connecting wall interconnecting said side walls, said guide rails being installed in the door in such a manner as to be turned at said connecting walls toward each other;

a pair of roller units movably engaged with said guide rails and movable with the window pane, each of said roller units including a first shaft and a roller rotatably carried on said first shaft, said first shaft being elongated toward and away from said connecting wall and having an end adjacent the same; and

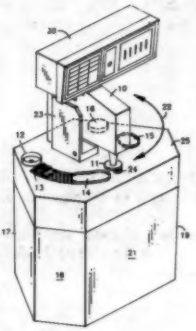
an abutment member mounted on said end of said first shaft and disposed to provide a predetermined clearance between said connecting wall and said abutment member, said abutment member being abuttingly engageable with said connecting wall when said roller moves a predetermined amount toward said connecting wall.

4,680,893

APPARATUS FOR POLISHING SEMICONDUCTOR WAFERS

Paul W. Cronkhite, Scottsdale; Bruce C. Bosley, Mesa; James H. Jones, Phoenix, and Asit G. Patel, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 779,339
Int. Cl.[4] B24B 7/04
U.S. Cl. 51—5 R 6 Claims



1. Apparatus for polishing semiconductor wafers having at least first and second turntables and a polishing arm for moving the wafers from one location to another, comprising: a wafer chuck mounted to the polishing arm for picking up a semiconductor wafer, the wafer chuck having capability to dispense water to rinse the wafer before pick up and to use a vacuum to pick up the wafer; a leveling station mounted on the apparatus to assist mounting the wafer chuck in a predetermined orientation; first and second polishing pads mounted on the first and second turntables, respectively, the first polishing pad having a predetermined shape to receive the wafer for primary polishing; and at least one high pressure water jet mounted adjacent the turntables to clean the polishing pads after a polishing operation wherein the wafer chuck is mounted on a shaft which is at a small angle from perpendicular to the turntables and the leveling station serves to assist mounting the wafer chuck perpendicular to the shaft.

4,680,894

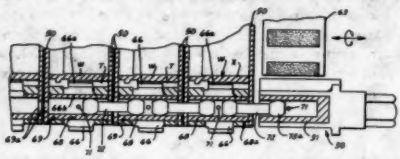
FIXTURE FOR HONING THIN WALL GEAR PARTS

Paul Fitzpatrick, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 25, 1983, Ser. No. 516,624
Int. Cl.[4] B24B 5/18
U.S. Cl. 51—50 R 9 Claims

9. A honing machine for honing multiple annular workparts

each having an internal diameter to be honed and external teeth, said machine comprising multiple workpart positioning assemblies on which a respective one of the workparts is disposed, multiple yoke means each for pivotally supporting a respective one of the workpart positioning assemblies such that the workpart positioning assemblies are in stacked relation and the internal diameter of each respective workpart thereon can align itself with a honing tool, and means for driving the workparts in rotation during honing of the internal diameter, said



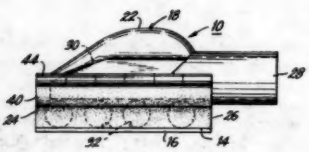
means fr driving the workparts including a hollow bushing rotatable on each assembly, an individual workpart driving gear mounted on the hollow bushing for rotatin therewith and meshing with the teeth of the respective workpart on each assembly, a driver member extending between adjacent assemblies and interconneting adjacent bushings therein and drivingly received in same so as tot rotate said bushings and workpart driving gears thereon during honing so that the workparts can be driven in rotation during honing.

4,680,895

BLOCK SANDER VACUUM

Jerome R. Roestenberg, 11 Woodpecker La., Levittown, N.Y. 11756

Filed Sep. 2, 1986, Ser. No. 902,852
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 R **11 Claims**



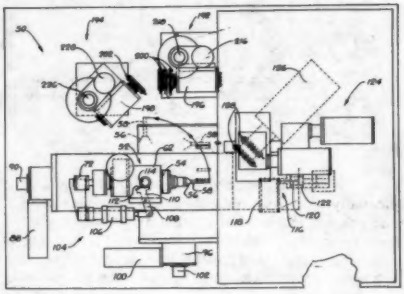
1. A hand-powered abrading device comprising:
a substantially rigid body having a substantially planar bottom and a plurality of ports in a first lateral side thereof;
abrading means on the bottom of the body;
handle means on top of the body for holding the body and moving it longitudinally to abrade an object beneath the body in contact with the abrading means;
passage means extending laterally and longitudinally through the body and adapted to connect the ports to a source of vacuum; and
a first depending skirt connected to the body above the ports in the first lateral side and extending longitudinally along, and adjacent to, the first lateral side of the body and the ports therein; the first skirt: (a) substantially covering the ports in the first lateral side, (b) being spaced laterally away from the first lateral side and the ports therein, and (c) extending downwardly beneath the ports to at least about the bottom of the body.

4,680,896

TOOL UNLOADING MECHANISM FOR AUTOMATIC TOOL GRINDING MACHINE

Charles T. Breitenstein, Elk Grove Village, and Allen R. Holecek, Rockton, both of Ill., assignors to Carbide International Inc., Elk Grove Village, Ill.

Division of Ser. No. 524,443, Aug. 18, 1983, Pat. No. 4,608,643.
This application Oct. 3, 1985, Ser. No. 784,359
Int. Cl.[4] B24B *47/02*
U.S. Cl. 51—215 UE **2 Claims**



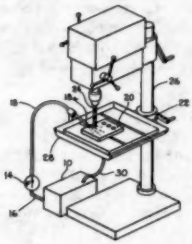
1. An unloading mechanism for a tool grinding machine for grinding drills or other tools, said mechanism comprising
a chuck for holding a tool,
a turret having a plurality of angularly spaced openings for receiving successive finished tools from said chuck,
a carriage for supporting said turret,
means for rotatably mounting said turret on said carriage,
detent means for detaining said turret with the successive openings in an unloading position to receive the successive finished tools,
power means for causing relative reciprocating movement between said carriage and said chuck to bring said unloading position into and out of alignment with said chuck,
means for ejecting a tool from said chuck into the opening at said unloading position,
and indexing means operative upon relative movement of said carriage and said chuck out of alignment for indexing said turret through one angular step to bring the next opening into the unloading position,
said mechanism including means for supporting said carriage for reciprocating movement relative to said chuck,
said power means including means for reciprocating said carriage to move said unloading position into and out of alignment with said chuck,
said indexing means including a ratchet wheel on said turret,
a pawl positioned for engagement by said ratchet wheel upon movement of said carriage out of said unloading position for advancing said ratchet wheel to index said turret through one angular step,
a stationary pivot supporting said pawl for swinging movement,
a spring biasing said pawl into the path of said ratchet wheel,
and a stop limiting the swinging movement of said pawl under the biasing action of said spring.

4,680,897

METHOD FOR MACHINING HOLES IN COMPOSITE MATERIALS

Julia G. Daniels, Madison; Frank E. Ledbetter, III, Huntsville; Johnny M. Clemons, Trinity; Benjamin G. Penn, and William T. White, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 3, 1985, Ser. No. 804,039
Int. Cl.[4] B24C *1/08*; B23B *35/00*
U.S. Cl. 51—281 R 5 Claims



1. A method for machining a hole in a composite material of the type having fiber reinforcement, comprising:

providing a rotating boring tool for rotationally machining the hole in a work surface of the composite material;

fixedly supporting the composite material for receipt of said rotating boring tool in said work surface;

applying a liquid slurry mixture of water and between thirty and sixty present silicon carbide powder to said work surface of the composite material;

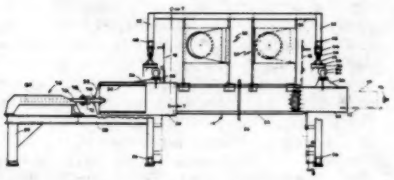
machining the hole in said work surface on said composite material with said rotating boring tool while applying said liquid slurry mixture to said work surface; said liquid slurry mixture being allowed to become interposed between said rotating boring tool and the composite material as the hole is being machined, so that said liquid slurry mixture acts as a cutting medium for enabling said rotary boring tool to provide the hole with a well-defined, substantially cylindrical interior surface.

4,680,898

METHOD AND APPARATUS FOR CLEANING WORKPIECES

James H. Carpenter, Jr., 212 Pangborn Blvd., Hagerstown, Md. 21740

Continuation-in-part of Ser. No. 602,614, Apr. 20, 1984. This application Apr. 1, 1985, Ser. No. 716,926
Int. Cl.[4] B24C *3/08*
U.S. Cl. 51—419 26 Claims



1. Apparatus for cleaning workpieces by the impingement of abrasive particles, comprising:

a generally horizontally oriented barrel having first and second ends, the barrel having at least one opening along its length, the barrel open at both ends to define a feed end and an exit end, the openings at the ends of the barrel permitting workpieces to enter and exit the barrel, the opening along the length of the barrel permitting abrasive particles to be projected into the barrel;

a stationary support frame for holding the barrel;

means for rotating the barrel about a longitudinal axis of the barrel, the means for rotating the barrel being carried by the support frame;

abrasive particle throwing means disposed adjacent the barrel for projecting abrasive particles through the opening along the length of the barrel onto workpieces passing through the barrel; and

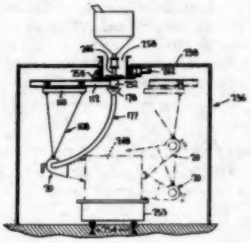
means for advancing the workpieces through the barrel, a portion of, the means for advancing the workpieces through the barrel being maintained stationary relative to the barrel, the means for advancing the workpieces engaging the barrel and oscillating the barrel such that workpieces disposed in the barrel are moved from the feed end to the exit end.

4,680,899

PORTABLE ABRASIVE THROWING WHEEL DEVICE

James H. Carpenter; Ronald L. Mullins, and Ronald L. Smith, all of Hagerstown, Md., assignors to Pangborn Corporation, Hagerstown, Md.

Continuation-in-part of Ser. No. 681,512, Dec. 13, 1984, Pat. No. 4,561,220, which is a continuation of Ser. No. 509,664, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 223,026, Jan. 6, 1981, abandoned. This application Dec. 20, 1985, Ser. No. 811,204
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—427 5 Claims



1. A portable abrasive throwing wheel system secured to an overhead support means comprising a portable abrasive throwing wheel device including a drive motor, an abrasive supply, an abrasive supply line extending from said abrasive supply to said portable abrasive throwing wheel device, an overhead cantilevered boom depending from said overhead support means and having a rotary fitting permitting rotation thereabout in a horizontal plane, suspension means suspending said portable abrasive throwing wheel device from said cantilevered boom for swinging movement and including (a) a hanger means on said throwing wheel device for directly supporting the wheel, (b) a carriage means movable along said cantilevered boom, and (c) flexible support members connecting said hanger means to said carriage means, said supply line extending through said rotary fitting, and said rotary fitting providing for a 360° rotation of said cantilevered boom.

4,680,900

DEVICE FOR ACCELERATING AN ABRASIVE

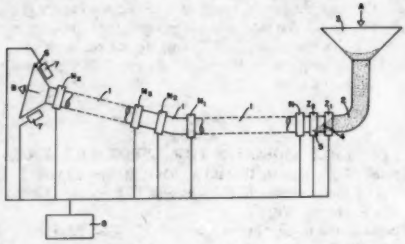
Jost Wadephul, Ketzendorfer Grund 23, D-2150 Buxtehude, and Jürgen Westphalen, Holsteinring 19, D-2359 Kisdorf, both of Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,501
Int. Cl.[4] B24C *5/08*
U.S. Cl. 51—430 7 Claims

1. In a device for accelerating an abrasive, which comprises

magnetically influenceable particles taken from a storage supply location thereof via a magnetic field in which the particles are movable along a predetermined acceleration path in the device, for the purpose of abrasively treating a surface; said device being provided with magnet coils, which are used as accelerating elements, are disposed along the path of said abrasive through said device, and are energized or de-energized by the magnetic field as a function of the traversing of the abrasive which moves in the coil field;

the improvement wherein said device in combination therewith inlcudes an acceleration section having an inlet end



for receiving abrasive, and an outlet end for discharging abrasive; first and second ones of said magnet coils, which are numbered in the direction of flow of abrasive through said acceleration section, are disposed near said inlet end of the latter; said first and second magnet coils being located for magnetic feed adjoining each other and also oppositely located surfaces have the same electrical polarity, and also are synchronously energized or de-energized to take the abrasive including the magnetically influenceable particles fed from the storage supply location thereof to the acceleration path in the device.

4,680,901

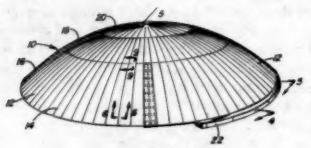
PRECAST CONCRETE DOME SYSTEM

J. Herbert Armitage, Calgary, Canada, assignor to Genstar Structures Limited, Calgary, Canada

Filed Nov. 5, 1985, Ser. No. 795,247

Int. Cl.[4] E04B *1/32*

U.S. Cl. 52—81 **9 Claims**



1. A domed self-supporting frameless building structure comprising a plurality of monolithic precast, elongated, concrete panels arranged in marginal edge-to-edge compressive force transmitting mutually interdependent supporting relationship with one another such that said panels are under compressive loadings along their marginal edges in both the longitudinal and lateral directions, the longitudinal edges of each of said panels coinciding with imaginary lines of longitude of a spherical or sphere-like shape; there being a plurality of circumferential courses of said panels with the panels of each said course being in end-to-end compressive force transmitting relation with the panels of the next adjacent course, a tension ring surrounding the lower extremity of the lowermost course of said panels and the lowermost ends of the panels of said lowermost course being in abutting force transmitting relation with said ring thereby to assist in securing all of said panels together in said marginal edge to edge compressive force transmitting relationship so that the domed structure behaves as a thin shell with all of said panels being under said compressive loadings and wherein the longitudinal edges of said panels have elongated step-like recesses therein such that, in their edge-to-edge relation, an elongated U-shaped recess is defined at the joint between each adjacent pair of said panels, each said recess containing a grouting compound to fill the joints between said panels, and the ends of said panels of each course which are in said end-to-end relation with the panels of the next adjacent course having recesses therein forming lapped joints between said ends of said panels in adjacent courses such that during erection the end of each panel of a succeeding course may be supported from the end of an adjacent panel of the preceding course.

4,680,902

UNITIZED PARTITION SYSTEM

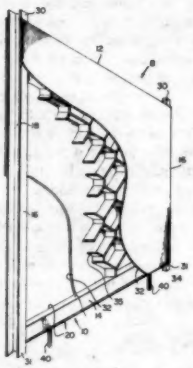
William S. Stefnik, 955 Lake Christina Way SE., Calgary, Alberta, T2J 2R2, and Frank J. Grims, 28 Deerwood Road SE., Calgary, Alberta, T2J 6E1, all of Canada

Filed Aug. 16, 1985, Ser. No. 766,430

Claims priority, application Canada, Aug. 24, 1984, 461795

Int. Cl.[4] E04G *21/14*; E04B *2/82*

U.S. Cl. 52—126.4 **5 Claims**



1. A non-progressive system for the construction of partition walls comprising:

(a) a floor channel adapted to be secured to a building floor;

(b) a ceiling channel adapted to be connected to a building ceiling;

(c) a series of rectangular panel assemblies each including: a rectangular frame having top, bottom and side edges, a pair of rectangular panels secured to opposite sides of said frame, and a pair of adjustable support members associated with the bottom side of the frame and in contact with the floor channel; and wherein the side edges of the frame form extensions extending beyond the top and bottom edges thereof and include longitudinal recessed channels and wherein, in use, the top of each said extension is spaced from said ceiling channel; and,

(d) for installation between each pair of said panel assemblies an elongated spline extending into said ceiling channel and including first and second lateral extensions adapted to connect two adjacent panel assemblies, said spline adapted to be moved laterally from a first position in which said lateral extensions are contained entirely within the said recessed channel of one panel assembly to a second position wherein the first and second lateral extensions extend respectively into the adjacent recessed channels of said

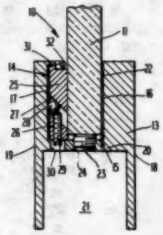
pair of adjacent panel assemblies, said spline being longer than the length of the frame side edge member.

4,680,903

DOOR SHOE ASSEMBLY

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed May 14, 1986, Ser. No. 862,994
Int. Cl.[4] E04C 2/38
U.S. Cl. 52—127.8 20 Claims



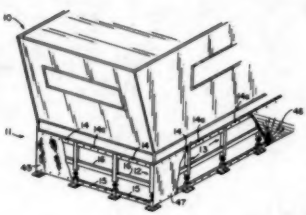
1. A metal frame and glass panel structure comprising:
(a) a metal shoe having a channel therein, said channel having at least one smooth side surface and an opposite side surface spaced apart from said smooth side surface;
(b) a glass panel positioned within said channel against said smooth side surface and spaced apart from said opposite side surface; and
(c) a plurality of independent expandable pressure units disposed within said channel for retaining said glass panel in said channel, each of said pressure units comprising:
(1) a pressure block disposed within said channel between said glass panel and said opposite side surface; and
(2) adjustable pressure generating means within said block for laterally expanding said pressure unit to simultaneously create pressure on said opposite side surface and an even pressure on said glass panel, whereby said glass panel is forced against said smooth side surface to secure said glass panel within said channel.

4,680,904

MOBILE HOME SKIRTING SYSTEM

Don R. Stoecker, Georgetown Lake, Anaconda, Mont. 59711

Filed Nov. 17, 1986, Ser. No. 931,354
Int. Cl.[4] B60R 27/00; E02D 27/00
U.S. Cl. 52—169.12 5 Claims



1. Apparatus for enclosing the underside of a mobile home comprising:
a corner post disposed under each exterior corner of said mobile home, each of said corner posts comprising a main housing having four planar sides, a first side having a pair of openings therein spaced apart by a predetermined distance and a second side, perpendicular to said first side, said second side also having a pair of openings spaced apart by said predetermined distance and a base member adapted to contact the ground, a threaded member threadably engaging a bottom portion of said main housing and a top portion of said base member, said threaded member having right-hand external threads on one end thereof and left-hand external threads on the other end thereof and central means thereon for selectively rotating said threaded member to selectively lengthen or shorten the effective distance between said main housing and said base member, and square tubular extension means extending from first and second sides of said base member thereof;
an intermediate post disposed between each of said corner posts, each of said intermediate posts comprising an elongated housing having the top end in abutment with a bottom portion of said mobile home, a base housing adapted to contact the ground and an extension rod threadably engaged on the top thereof with the bottom of said elongated housing and the bottom thereof threadably engaged with the top of said base housing, one end of said extension rod having right hand external threads thereon and the other end having left hand external threads thereon and means attached to said extension rod for rotating said extension rod to selectively shorten or lengthen the effective distance between said elongated housing and said base housing, said elongated housing having a pair of spaced holes therein on each of a first and a second side thereof, said first and second sides of said elongated housing being parallel to each other, and said base housing having a square tubular extension means extending from each of first and second parallel sides thereof, said square tubular extension means being aligned with each other and having a common longitudinal axis;
top horizontally disposed link means for interconnecting adjacent corner posts and intermediate posts, the end of said top horizontally disposed link means having extensions thereon for extending into said openings in said main housings of said corner posts and holes in said elongated housing in said intermediate posts;
bottom horizontally disposed link means for interconnecting with adjacent base members of said corner posts and base housings of said intermediate posts, said bottom horizontally disposed link means being telescopically connected on the ends thereof to the square tubular extensions on said base members of said corner posts and said base housing of said intermediate posts;
intermediate horizontally disposed link means for interconnecting with adjacent main housings of said corner posts and elongated housing of said intermediate posts, said intermediate horizontally disposed link means having extensions thereon for selectively extending into said openings in said main housing of said corner posts and said holes in the elongated housing in said intermediate posts, said intermediate horizontally disposed link means being below said top horizontally disposed link means and below said bottom horizontally disposed link means;
a covering for extending around the entire mobile home;
means for selectively attaching or detaching the top of said covering to said top horizontally disposed link means; and
means for selectively attaching or detaching said covering to the bottom horizontally disposed link means whereby the mobile home can be sealed thereunder from outside air.

4,680,905

RAFTER WITH INTERNAL DRAINAGE FEATURE AND SLOPED GLAZING SYSTEM INCORPORATING SAME

James A. Rockar, Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 768,985
Int. Cl.[4] E04B 7/18
U.S. Cl. 52—200 1 Claim

1. A sloped curtainwall system for a building or the like, comprising:
at least one panel having an inner surface facing the building

interior and an opposite outer surface with the outer surface having vertical and horizontal marginal edges and the innner surface having vertical and horizontal marginal edges;

a plurality of elongated rafters;

a plurality of purlins;

means for interconnecting said rafters and purlins to provide a grid having at least one opening for receiving said panel;

at least one of said rafters having:

an enclosed chamber extending along its length;

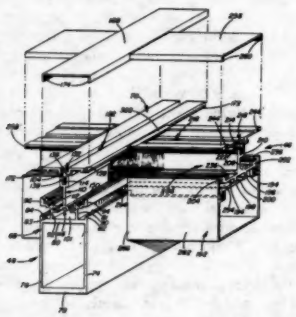
a first bearing and sealing means engaging outer vertical marginal edge is said panel;

a second bearing and sealing means engaging inner vertical marginal edges of said panel;

said first and second bearing and sealing means engaging said panel minimizes movement of moisture, air, dust and the like from the building exterior to the building interior around the vertical marginal edges of said panel; and

said first and second bearing and sealing means defining a vertical pocket in fluid communication with said enclosed chamber and including a vertical condensation gutter for receiving and collecting moisture from the interior surface portion of the curtainwall system;

at least one of said purlins having a horizontal pocket defined by means for engaging and outer horizontal marginal edge portions of said panel and at least one of said



purlins having a horizontal condensation gutter for receiving and collecting moisture from the interior surface portions of the curtainwall system;

means for providing fluid communication between said enclosed chamber and horizontal pocket of said at least one of said purlins to move moisture from the horizontal pocket to said enclosed chamber;

means for providing fluid communication between said horizontal and vertical condensation gutters, said fluid providing means located in close proximity to rafter-purlin crossing;

sill means interconnecting adjacent ones of said rafter and sealing off bottom edge portions of said rafters, said sill means having an opening in fluid communication with said chamber and a condensation gutter in fluid communication with said vertical condensation gutter;

means interconnecting said vertical pocket or said horizontal pocket and exterior of the curtainwall system for pressure equalization;

a first trim cover element secured to said first bearing and sealing means of said at least one of said rafters:

a second trim cover element secured to outer portion of said means for engaging inner and outer horizontal marginal edge portions of said panel; and

wherein said means interconnection said vertical pocket or said horizontal pocket and exterior of the curtainwall system for pressure equalization includes a first hole in said first or said second cover element and a second hole in first bearing and sealing means or in said outer portion of said means for engaging inner and outer horizontal marginal edge portions of said panel, said first and second holes being offset from one another and check valves in said first or second holes.

4,680,906

COUPLER DEVICE FOR STRESSING CABLES, IN PRESTRESSED CONCRETE SLIDING CABLE STRUCTURES

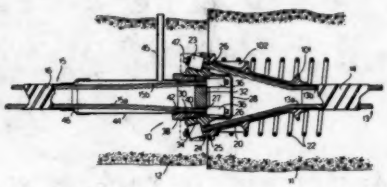
Cesare Prevedini, Milan, Italy, assignor to Ponteggi Est S.p.A., Italy

Filed Jun. 5, 1985, Ser. No. 741,348

Claims priority, application Italy, Jun. 5, 1984, 22084/84[U]

Int. Cl.⁴ E04C *5/12*

U.S. Cl. 52—223 L **3 Claims**



1. A coupler device for sliding cable prestressed concrete structures for anchoring the leading strand ends of a prestress cable of a previously cast beam section and the trailing strand ends of a prestress cable of a subsequently cast beam section, which device comprises a first element including seats for receiving grips carried by the leading strand ends and a casing defining an internal space for enclosing the trailing strand ends, a second element including seats for receiving grips carried by the trailing strand ends, means for clamping the first and second elements together, the seats carried by the grips of the trailing strand ends being enclosed within a space defined by the axes of the seats for the grips for the leading strand ends, and the first element including a through hole between an outer surface thereof and the internal space defined by the casing for venting air during injection of cement grout.

4,680,907

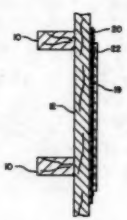
CONSTRUCTION MATERIAL

Richard D. Williams, 9725 NE. Shaver St., Portland, Oreg. 97220

Filed Oct. 28, 1985, Ser. No. 791,999

Int. Cl.⁴ E04C *1/40*

U.S. Cl. 52—309.17 **7 Claims**



1. A construction material comprising; a wood based moisture damageable structural substrate adapted to be fastened to a building as part of the building frame, a water impervious epoxy thinly layered directly over one surface of the substrate and firmly bonded thereto, a sand overlayer partially embedded into the epoxy layer to substantially cover the epoxy surface and present an epoxy free sand surface as the exposed

securing surface, and a cement based decorative facing material adhered to the sand surface.

4,680,908

REFRACTORY ANCHOR

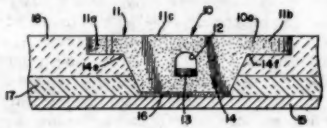
Michael S. Crowley, Chicago Heights, Ill., assignor to Amoco Corporation, Chicago, Ill.

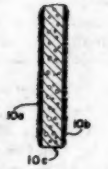
Continuation-in-part of Ser. No. 656,033, Sep. 28, 1984, Pat. No. 4,581,867, which is a continuation-in-part of Ser. No. 331,181, Dec. 16, 1981, Pat. No. 4,479,337, which is a continuation of Ser. No. 140,174, Apr. 14, 1980, abandoned. This application Feb. 28, 1985, Ser. No. 706,641

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] E04B *1/24*; E04C *2/04*

U.S. Cl. 52—378 **19 Claims**





1. A refractory anchor for minimizing erosion and increasing the useful life of refractory linings in reactors and other vessels, comprising:

an overhead elongated crossbar having opposite ends and a substantially flat intermediate portion defining a plane positioned between and connecting said opposite ends, at least one of said opposite ends having an arcuate portion curving in a direction away from said plane, said arcuate portion defining a curved baffle for arcuately deflecting and substantially blocking gases flowing along the refractory lining adjacent said refractory anchor;

a substantially planar base extending generally downwardly from said flat intermediate portion of said crossbar for reinforcing said refractory lining, said planar base lying in substantially the same plane and being positioned substantially in coplanar relationship with said flat intermediate portion of said crossbar, said planar base having flared sides diverging generally upwardly towards said crossbar, said sides intersecting said opposite ends, respectively, of said crossbar at obtuse angles of inclination and cooperating with said ends of said crossbar to define pockets for receiving said refractory lining; and

said crossbar and said base having an outer layer and a core, said outer layer and said core comprising a metal and a corrosion resistant material, and said outer layer having a greater concentration of said corrosion resistant material than said core.

4,680,909

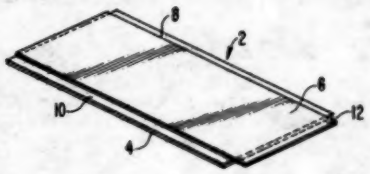
ROOFING SYSTEM

Victor M. Stewart, Redmond, Wash., assignor to Industrial Research Development, Inc., Redmond, Wash.

Filed Sep. 11, 1984, Ser. No. 649,309

Int. Cl.[4] E04B *7/00*; E04C *1/40*; E04D *1/00*

U.S. Cl. 52—409 **2 Claims**



1. Apparatus for installation on a roof comprising a plurality of panels, each panel comprising base member means and covering means wherein said covering means is a sheet secured to an upper surface of said base member means and having one end substantially flush with one end of said base member means, two sides, each of which is spaced inwardly from a respective side of said base member means, said covering means leaving uncovered an edge strip on each side of said base member means, and a second end which extends beyond a second end of said base member means, and further comprising spacer means for being secured to a roof between adjacent prefabricated panels and closure means for covering said spacer means and exposed side portions of said adjacent prefabricated panels.

4,680,910

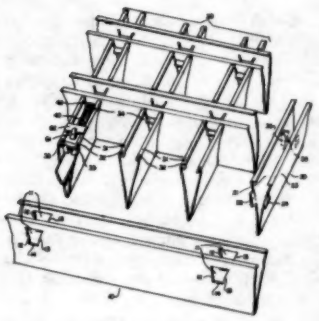
HOLLOW-LOUVERED CEILINGS

William E. Perk, 3419 E. 65th St., Cleveland, Ohio 44127

Filed Sep. 20, 1985, Ser. No. 778,369

Int. Cl.[4] E04B *5/52*; E04C *2/42*

U.S. Cl. 52—489 **2 Claims**



1. In a louvered ceiling comprising panels of channel-shaped louver members suspended from channel-shaped runners, the improvement comprising

a channel-shaped runner having a first sidewall and having an opening in said first sidewall;

a channel-shaped louver member having second and third sidewalls with ends abutting said first sidewall, such that said opening in said first sidewall lies between said two abutting ends of said second and third sidewalls;

extension means carried by said channel-shaped louver member, said extension means being spring-movable and extending into said opening in said first sidewall;

said extension means being insertable into and removable

from said opening in said first sidewall without deformation of said first sidewall and said extension means being concealed within said runner or said louver member, or within both, after said louvered ceiling is installed; and

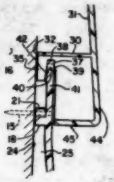
said extension means comprising a spring and a plunger member carried within said channel-shaped louver member, said spring tending to urge said plunger member in a direction parallel to said channel-shaped louver member and toward the interior of said channel-shaped runner.

4,680,911

DECORATIVE WALL COVERING

Richard A. Davis, 1251 NW. 165th St., Miami, Fla. 33169, and Wilfrid E. Davis, 800 E. Northwest Hwy., Palatine, Ill. 60067

Filed May 21, 1986, Ser. No. 865,284
Int. Cl.[4] E04D *1/26, 1/34*
U.S. Cl. 52—521 **6 Claims**



1. A panel adapted to cover and to be sealingly engaged against a wall comprising top and bottom horizontal edge regions and left and right vertical edge regions

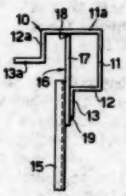
sealing means along said top and bottom horizontal edge regions and along the left and right vertical edge regions for sealing the peripheral edges of said panel against said wall, said top horizontal edge region being sealed when said panel is fastened along its top region to said wall, said bottom horizontal edge region being sealed when the bottom horizontal region of said panel is interlockingly connected to the top horizontal region of a second panel positioned below said panel, one of said side vertical edge regions being sealed when said panel is overlappingly positioned over a side vertical edge region of a third panel positioned at the side of said panel, and the other of said side vertical edge regions being sealed when a side vertical edge region of a fourth panel is overlappingly positioned at the side of said panel, said bottom horizontal edge region sealing means comprising a flange member along the bottom length of said panel and extending substantially horizontally outward from a back surface of said panel thereby forming a straight and flat planar sealing surface, said flange member including a plurality of tab members attached to and spaced along the length of said flange member and extending in a vertical direction away from said top horizontal edge region forming a slot between said tab members and the back of said panel, said slots being positioned to engage the top horizontal region of said second panel and to sealingly position said flange member against said wall, each of said slots including a ramped, generally vertical, surface tapering in a direction from a top of said slot away from the back surface of said panel, whereby the lowering of said panel onto the top of said second panel causes the bottom horizontal sealing surface to progressively move toward and into sealing contact with said wall, each of said slots including a horizontal ledge along the surface of said slot opposite to the ramped surface whereby said panel is properly positioned horizontally with said second panel upon engagement of the top horizontal edge surface of said second panel with said plurality of ledges.

4,680,912

STRUCTURE FOR METAL CONSTRUCTIONS IN GENERAL, IN PARTICULAR FOR TRESTLEWORK CONSTRUCTIONS, ACCOMPLISHED BY MEANS OF SECTION BARS AND JOINTING ELEMENTS

Antonio Pantalone, Via Carpaccio, 4, Milan, Italy

Filed Mar. 28, 1986, Ser. No. 845,558
Claims priority, application Italy, Apr. 5, 1985, 20270 A/85
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—721 **27 Claims**



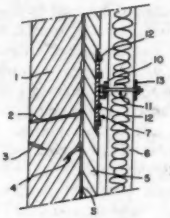
1. Structure for metal constructions in general and in particular for trestlework constructions comprising at least one angle iron having a pair of generally equal length legs, each leg being extended at a free end thereof by a first extension length positioned at right angles relative to its associated leg and projecting therefrom in the same general direction, a second extension length of each leg positioned at right angles relative to its associated first extension length in such a direction as to depart from each other, said first and second extension lengths having each one a width substantially equal to half the width of a leg of the angle iron, a jointing element constituted by at least one plate, and means for fastening said one plate to said angle iron at an inner surface of one of its legs and to an inner surface of the second extension length of said second leg.

4,680,913

PROCESS FOR PRODUCING AIRTIGHT SEALING OF BUILDINGS

Pierre Geisen, Strasbourg; Jean-Claude Reillaudoux, Souffelweyersheim, and Bernard Ducret, Schwindratzheim, all of France, assignors to Soprema S.A., Strasbourg-Neuhof, France

Filed Jan. 20, 1984, Ser. No. 572,409
Claims priority, application France, Sep. 29, 1983, 83 15687
Int. Cl.[4] E04B *1/66*
U.S. Cl. 52—746 **9 Claims**



1. In a process for producing airtight sealing of buildings with the aid of a manufactured sheet of constant thickness, and with the aid of perforated mounting plates, said manufactured sheet including a reinforcement of organic fibers covered in a mass of bituminous binder, the steps comprising

causing said manufactured sheet to adhere fully on a zone to be treated, said zone including a substrate, so as to produce a continuous dressing, and whatever the nature and shape of said substrate,

attaching an insulation over said dressing without perforating said sheet, by applying said perforated mounting plates by hot pressing into a surface zone of said dressing, so that said perforated mounting plates serve, after cooling, as points of support for said insulation, and

selecting said bituminous mass from the group consisting of oxidised bituminous binders, bitumens modified with thermoplastic polymers of the styrene-butadiene-styrene type, and bitumens modified with plastic polymers of the atactic polypropylene type.

4,680,914

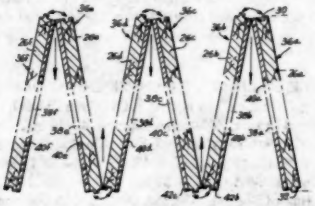
METHOD OF INSTALLING MARBLE PANELS

Nell Migliore, 234 New York Ave., Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 763,524, Aug. 8, 1985, Pat. No. 4,640,076, and a continuation-in-part of Ser. No. 766,270, Aug. 16, 1985, Pat. No. 4,601,147. This application Feb. 21, 1986, Ser. No. 832,049

Int. Cl.[4] E04G *21/00*

U.S. Cl. 52—747 **6 Claims**



1. A method of installing marble panels on a flat wall, comprising the steps of:

cutting a slab of marble having a front face and opposite ends, into a plurality of thin marble layers;

attaching a backing panel to each marble layer to form a plurality of marble panels;

installing marble layers which represent successive cuts from said slab of marble adjacent to each other on said flat wall with adjacent side edges thereof which correspond to the same end of said slab of marble being in abutting relation, to form a continuous pattern of said flat wall.

4,680,915

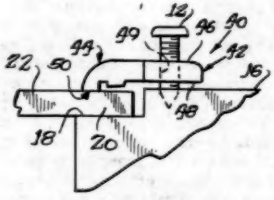
TAPERED SURFACE PANEL RETAINER

Earl D. Bush, Downers Grove, Ill., assignor to Handy Button Machine Company, Melrose Park, Ill.

Filed Jun. 30, 1986, Ser. No. 879,925

Int. Cl.[4] E06B *3/62*

U.S. Cl. 52—766 **5 Claims**



1. A panel retainer comprising: a one-piece integrally formed member, formed from a resilient, elastically bendable material, and having a fastener-receiving portion and a panel-gripping portion; said fastener-receiving portion comprising a body portion having a top surface and a substantially flat bottom surface spaced from said top surface, said body defining a through aperture for receiving a fastener to secure the retainer to a given surface; and said panel-gripping portion comprising a further body portion projecting from said first body portion and having means defining thereupon a substantially flat tapered, panel-engaging surface portion diverging from said first body portion bottom flat surface in the direction of a panel to be retained thereby for engagement therewith; said gripping portion being flexible in the area where it joins with said fastener-receiving portion to permit resilient, elastic bending thereof for engagement of said flat tapered surface in a substantially flat surface-to-surface engagement with said panel.

4,680,916

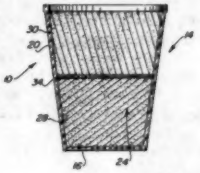
STAGED DETERGENT/FABRIC TREATING PREPARATION FOR USE IN WASHING MACHINES

Martin E. Ginn, 9327 N. Kostner, Skokie, Ill. 60076

Division of Ser. No. 689,455, Jan. 7, 1985, Pat. No. 4,588,080. This application Mar. 7, 1986, Ser. No. 837,217

Int. Cl.[4] B65B *63/08*

U.S. Cl. 53—440 **4 Claims**



1. The method of preparing a composite multi-layer plug including as physically distinct elements a fabric washing agent and a fabric conditioner, and in which said washing agent and said conditioner are bonded to one another to constitute a unitary assembly,

said plug functioning in a tub of a washing machine and being operative to delay dissolution release of the fabric conditioner until a substantial portion of the washing agent has dissolved in and has dispersed throughout the washing solution during a wash cycle of a washing operation, said method including the steps of:

preparing a concentrated fabric treating composition as a heated, fluidized slurry,

introducing said slurry into a water-impervious, water-insoluble cup-like receptacle to define a base layer therein,

cooling said slurry to form a solid pellet-like disc bonded contiguously to a floor and to a circumscribing bounding wall of said receptacle,

preparing a heated concentrated detergent mixture in a fluidized form,

adding said mixture to said container intimately to overlie said disc,

cooling said detergent mixture to effect an intimate bond with a top surface of said disc to form a multi-layer plug, and to establish a fluid-tight seal of said plug to a circumscribing wall of said receptacle, and

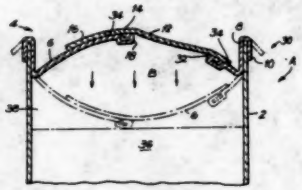
retaining said plug within aid container for ultimate introduction of said plug and said container into a tub of a washing machine.

4,680,917

PROCESS FOR PROVIDING FILLED CONTAINERS

Thomas P. Hambleton, Pine Bush, N.Y.; Erick Guevara, Huntingdon Valley, Pa., and Peter Rychiger, Steffisburg, Switzerland, assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 642,054, Aug. 17, 1984, Pat. No. 4,557,398.
This application Mar. 18, 1985, Ser. No. 713,364
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] B65B *63/08*
U.S. Cl. 53—440 3 Claims



1. A process for providing a filled container comprising the steps of:

filling an open top end closed bottom end container with a hot-fill material in its heated condition to a predetermined level in said container;

providing a top end closure structure which includes a flexible central member having an outwardly dished center section and at least one opening structure having an opening therein disposed in said central member, and a removable flexible closure member disposed over said opening structure which is in a first sealing relationship with a portion of said opening structure and a second sealing relationship with a top surface of said central member;

sealing said top end closure structure on said open top end of said container with sealing means, said sealing means being disposed from a peripheral edge of said central member;

cooling the hot-fill material to ambient temperature in said container; and

dishing inwardly the center section of said flexible central member of said end closure structure during said cooling step so there is substantially atmospheric pressure or slight vacuum pressure within said sealed container after the hot-fill material has cooled to ambient temperature to prevent stress on at least one of said first and second sealing relationships associated with sealing the opening in the opening structure with said removable thin flexible closure member, said inward dishing step being facilitated by said flexible central member and said thin flexible closure which readily flex during the cooling process.

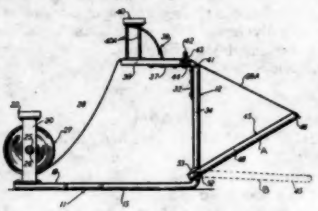
4,680,918

PACKAGING WITH COHESIVE COATED MATERIALS

Robert C. Lovell, 725 N. Glendale Ave., Glendale, Calif. 91206

Filed Jun. 6, 1986, Ser. No. 872,201
Int. Cl.[4] B65B *11/48*
U.S. Cl. 53—466 4 Claims

1. A process for folding cohesive sheet material about an object to form a sealed package using a framework with a material supply reel and a mandrel and a crimp frame pivotably movable with respect to said mandrel, and a paper cutoff movable transversely of mandrel, including the steps of loading the reel with cohesive material in roll form, threading said material over a platform and the mandrel to contact with an upraised crimp frame, securing the advance edge of the material to the top bar of the crimp frame manually, pivoting the crimp frame waway from the mandrel sufficiently to define a material sleeve for both obverse and reverse sides of the object being packaged, depositing the object against the material near the middle of the material web formed by extending the frame from the mandrel with the material edge still held manually to the frame, returning the loaded crimp frame with the material edge still held manually to an upright postition adjacent the cohesive material-draped mandrel to contact both sides of the



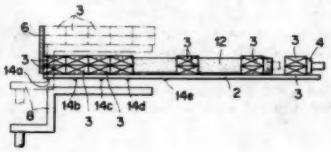
object with material, pressing the crimp frame past the mandrel to compress the material between the mandrel and the frame and bond the two folded edges of the material together at two sides and an end, and then manipulate the cutter transversely to sever the package thus formed from the material supply.

4,680,919

ARTICLE DELIVERY TRANSFERRING DEVICE IN A COLLECTIVE PACKING MACHINE

Shigemitsu Hirama, 9-34, Komagome 4 chome, Toshima-ku, Tokyo 170; Satoru Aida, 106-6, Nishinaka, Sanjo-shi, Niigata 955, and Hideo Soyama, 2-A-13, Takasu-cho 1 chome, Kamoshi, Niigata 959-13, all of Japan

Continuation of Ser. No. 634,385, Jul. 25, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 896,330
Claims priority, application Japan, Jul. 28, 1983, 58-138608
Int. Cl.[4] B65B *57/10*
U.S. Cl. 53—499 3 Claims



1. In an article delivery transferring device of a collective packing machine comprising a main packing machine and an auxiliary packing machine each having an individual driving source, wherein articles from the main packing machine in continuous operation are delivered and transferred to the auxiliary packing machine in batch sequence, the improvement comprising a grasping belt means arranged along an article conveying path between the main packing machine and the auxiliary packing machine, said belt means being arranged for grasping and directing said articles along said path and means for driving said grasping belts at a belt traveling speed corresponding to the operational speed of the main packing machine, and article detecting sensor means for detecting passage of a predetermined number (n) of articles along the article conveying path, said article detecting sensor means comprising a predetermined number (n) of sensors corresponding to said predetermined number (n) of articles and arranged along the article conveying path, and wherein the nth sensor is placed a predetermined distance upstream from the transferring device and along the article conveying path which predetermined distance is sufficient to provide early indication as to the passage of the nth article towards the transferring device prior to said nth article reaching a stationary transfer position in abutting end to end contact with the (n−1)th article, said nth

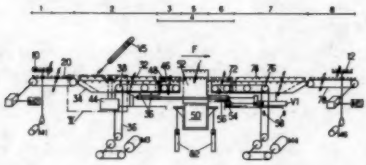
sensor generating a signal upon sensing said nth article for starting the auxiliary packing machine to provide continuous high speed synchronous operation of both the auxiliary packing machine and the main packing machine.

4,680,920

DEVICE FOR MOVING NUCLEAR FUEL ELEMENT SHEATHS AT A FIXED FILLING STATION

Bernard Veré , Brie et Angonnes - Eybens, and Paul Mathevon, Bollene, both of France, assignors to Societe Cogema, Framatome et Uranium Pechiney, Villacoublay, France

Filed Dec. 28, 1984, Ser. No. 687,228
Claims priority, application France, Dec. 30, 1983, 83 21125
Int. Cl.[4] B65B *1/08*
U.S. Cl. 53—525 **6 Claims**



1. A device for transferring nuclear fuel element sheaths at a filling station, comprising:

a first station for storage as a horizontal layer of a predetermined plurality of empty sheaths each having a closed end and an open end, said empty sheaths being in spaced relation to each other with a first predetermined mutual spacing;

a second station for storage of a predetermined plurality of filled sheaths as a horizontal layer of said plurality of filled sheaths, said filled sheaths being in spaced relation to each other with said first predetermined mutual spacing;

sheath-loading means located between said first and second stations on a transfer path of said sheaths along a predetermined direction and comprising filling means;

first conveyor means for simultaneously engaging said plurality of empty sheaths and moving them as a whole toward said loading means;

first pitch change means associated with said first conveyor means for repeatedly bringing part of a plurality of empty sheaths to a loading location confronting said sheath-loading means, comprising a first unit for increasing the mutual spacing between adjacent sheaths to a second predetermined spacing and presenting the sheaths of said plurality successively one by one at a weighing station and a second unit for decreasing the spacing of the sheaths again to a third predetermined spacing smaller than said second predetermined spacing for presentation to a vibrating table machine of said sheath loading means, for simultaneous filling of said part of the plurality of said empty sheaths with said filling means;

second pitch change means for repeatedly removing said part of the plurality of sheaths after filling said empty sheaths from said loading location and returning said sheaths to said first predetermined mutual spacing;

second conveyor means associated with said second pitch change means for moving said plurality of sheaths from said second pitch change means to said second station, and

control means for synchronized actuation of said conveyor means and pitch change means.

4,680,921

SAFETY STIRRUP FOR HORSE-RIDING

Michel Bezin, 42bis, Boulevard Victor Hugo, F-58000 Nevers, France

Filed Apr. 11, 1986, Ser. No. 850,543
Claims priority, application France, Apr. 12, 1985, 85 05513
Int. Cl.[4] B68C *3/00*
U.S. Cl. 54—49 **11 Claims**

1. A safety stirrup for horse-riding comprising a stirrup head having an eye and being attached to a corresponding stirrup-leather by means of a coupling device comprising a retaining element engaged in the eye of said stirrup head and a resilient member for maintaining said stirrup head applid against said retaining element while permitting disengagement of said retaining element in the event of an abnormal pivotal motion between said stirrup and said stirrup-leather, wherein said safety stirrup is distinguished by the following features:

(a) said coupling device comprises a resilient clamp having two jaws normally located in planes substantially parallel to the general plane of said stirrup, said two jaws being sized, shaped, and positioned to clamp the top portion of said stirrup head and being provided with bottom retaining noses engaged in the eye of said stirrup head and adjacently opposite one another;

(b) the top portion of said stirrup head has the shape of a cam so designed as to be capable of caussing incipient separation of said two jaws in the event of rotation of said cam about its own axis up to an angle of the order of 30° to 45° approximately, the lower end of said cam being such as to form a wedge corner which is capable of engaging between the bottom retaining noses of said two jaws in order to increase their relative spacing and thus to permit excape of said stirrup; and

(c) the cam which constitutes the top portion of said stirrup head has a flat bottom face which bears on the bottom retaining noses of said two jaws as well as two flat faces perpendicular to said bottom face and parallel to the general plane of said stirrup, said two jaws being normally applied against said two flat faces.

4,680,922

MOWER

William T. Arnold, Sutton West, Canada, assignor to Brouwer Turf Equipment Limited, Keswick, Canada

Division of Ser. No. 685,502, Dec. 24, 1984, Pat. No. 4,644,737.
This application Apr. 30, 1986, Ser. No. 857,281
Int. Cl.[4] A01D *35/24*
U.S. Cl. 56—7 **7 Claims**

1. A mower comprising:

(a) a frame,

(b) a reel mounted in said frame for rotation therein,

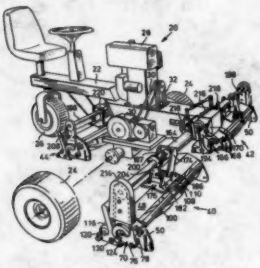
(c) a bed knife mounted on said frame and located behind said reel to cut grass between said reel and said bed knife,

(d) a first upstanding support adjacent one end of said mower and extending above said frame,

(e) a second upstanding support adjacent the center of said mower and extending above said frame,

(f) means rigidly connecting said upstanding supports together and coupling said supports to said frame,

(g) a drive shaft extending across the top of said mower and through said supports,



(h) a pulley connected to said drive shaft adjacent said first support, a pulley connected to said reel and drive belt means connected between said pulleys, and

(i) drive means connected to said drive shaft adjacent the center of said mower for rotating said drive shaft.

4,680,923

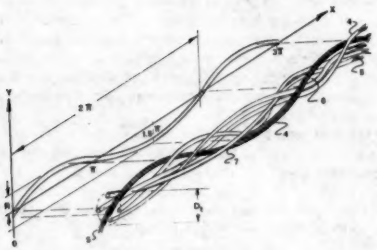
COMPOSITE TWINE STRUCTURE

Charles E. Kaempen, 3202 Larkstone Dr., Orange, Calif. 92669

Filed Mar. 27, 1985, Ser. No. 716,565

Int. Cl.[4] D02G *3/44;* **B32B** *5/02, 5/08;* **F16S** *5/00*

U.S. Cl. 57—251 **26 Claims**



1. A composite twine structure disposed on a longitudinal axis thereof comprising

a multiple of compacted continuous filament strands each composed of a multiple of individual continuous filament reinforcements, each of said filament strands extending at least generally in the direction of said axis to exhibit a center-pull helical frequency and configuration defined by a multiple of revolutions about said axis and about at least one other of said filament strands, each of said filament strands having helixes that are spaced relative to the helixes of the other filament strands in the direction of said axis, and

hardenable adhesive means impregnating said filament strands and forming a hardened bonding matrix for ridgedly maintaining said filament strands as said composite twine structure.

4,680,924

METHOD OF STARTING SPINNING OF A YARN IN A FRICTION SPINNING DEVICE

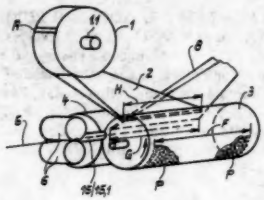
Emil Briner, and Richard Hieronymi, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 24, 1986, Ser. No. 922,683

Claims priority, application Switzerland, Oct. 31, 1985, 04685/85

Int. Cl.[4] D01H *15/02, 7/885*

U.S. Cl. 57—263 **12 Claims**



1. A method for starting or recommencing spinning of a yarn in a friction spinning device in which freely floating fibers are delivered through a fiber transport passage to a friction spinning surface of a friction spinning means and are forwarded on said friction spinning surface to a yarn formation position from which a spun yarn is withdrawn by yarn withdrawal means, said method comprising the steps of:

forwarding said freely floating fibers to said yarn formation position and twisting said freely floating fibers to form a rotating twisted fiber structure of substantially predetermined size;

forwarding said rotating twisted fiber structure by a first airstream towards said yarn withdrawal means; and

subsequently catching said rotating twisted fiber structure, and spun yarn adjoining thereon, by a yarn take-up means arranged subsequent to said yarn withdrawal means.

4,680,925

OPEN-END YARN PIECER

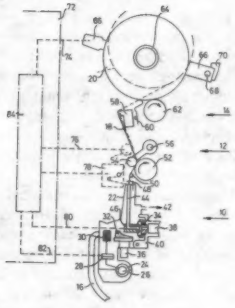
Jürg Bischofberger, Elsau, and André Lattion, Seuzach, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,709

Claims priority, application United Kingdom, May 20, 1983, 8313993

Int. Cl.[4] D01H *15/02*

U.S. Cl. 57—263 **18 Claims**



1. In combination,

a spinning machine having a plurality of spinning stations,

each said station including a spinning unit for spinning a yarn therein, feed means for feeding sliver to said spinning unit and a pair of nip rolls for withdrawing a yarn from said spinning unit; and

a travelling piecing apparatus movable along said machine for selective positioning with a respective spinning station, said apparatus including first means for separating said nip rolls of a selected station, second means for forming a yarn reserve in a seed yarn for back-feeding into said spinning unit of a selected station, control means to actuate said feed means of a selected station to feed sliver to said spinning unit thereof, said second means to release a yarn reserve for back-feeding to said spinning unit and said first means to re-engage said nip rolls for withdrawing of the seed yarn with the newly spun yarn pieced thereto, and timing means in said control means to time initiation of the re-engagement of said nip rolls from a predetermined timing reference.

4,680,926

PROCESS AND APPARATUS FOR THE PRODUCTION OF OVAL CHAIN LINKS FROM ROUND WIRE

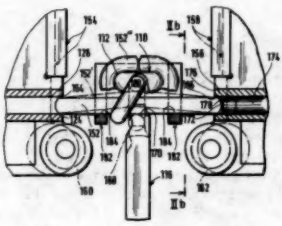
Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,915

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440907

Int. Cl.[4] B21L *1/02*

U.S. Cl. 59—27 **9 Claims**



1. A process for the production of oval chain links from pieces of wire of a given uniform length, comprising the steps of:

providing a single bending station having a cylindrical bending mandrel having a longitudinal axis and an annular groove extending round this axis in a vertical plane;

guiding a straight piece of wire, with its axis crossing at right angles with the longitudinal axis of said mandrel, in its longitudinal direction alongside of the mandrel at a free distance from said mandrel at the level of the groove;

first bending the piece of wire at the mandrel into a V-shaped piece with the arms of the V at an obtuse angle;

moving the middle of the piece of wire, forming the back of the link, perpendicularly to the mandrel axis and to the straight wire piece axis into a recess on the mandrel at its feed side and at the level of the said groove; and

bending the piece of wire which has thus been subjected to its initial bending into a C shape around the mandrel; and,

finally bending said piece of wire into an O shape by bending said piece of wire into the groove outside the mandrel recess until the longitudinal axis of the piece of wire follows the course of the groove, further comprising;

preventing the trailing free end of the piece of wire and the leading free end of said piece of wire from moving to any significant extent in a direction perpendicular to the longitudinal direction and direction of feed both of the straight piece of wire during the initial bending of the piece of wire and the simultaneous movement inwards of its middle into the mandrel recess by applying two parallel reactive forces on said free wire piece ends, respectively, in a direction opposite to the wire piece middle moving direction thereby preventing the free ends of the piece of wire from moving in the middle moving direction during the movement of the middle of the piece of wire towards the mandrel.

4,680,927

CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

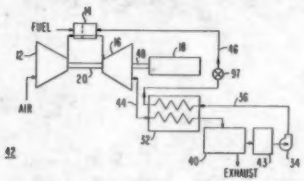
Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Palo Alto, Calif.

Continuation of Ser. No. 476,456, Mar. 18, 1983, Pat. No. 4,549,397, which is a continuation of Ser. No. 273,269, Jun. 21, 1981, Pat. No. 4,417,438, which is a division of Ser. No. 59,591, Jul. 23, 1979, Pat. No. 4,297,841. This application Jul. 25, 1985, Ser. No. 758,683

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.[4] F02C *7/00*

U.S. Cl. 60—39.3 **2 Claims**



1. In a dual-fluid heat engine, which can be operated to produce co-generated process steam having:

a chamber;

compressor means for introducing a first gaseous working fluid comprising air into said chamber, said compressor means having a predetermined pressure ratio (CPR);

means for introducing a second liquid-vapor working fluid comprising water in the form of a vapor within said chamber at a defined water/air working fluid ratio (XMIX);

means for heating said water vapor and air in said chamber at a defined specific heat input rate (SHIR);

turbine means responsive to the mixture of said first and second working fluids for converting the energy associated with the mixture to mechanical energy, the temperature of said mixture entering said turbine means defining the turbine inlet temperature (TIT) and having a design maximum turbine inlet temperature (TITmax);

counterflow heat exchanger means for transferring residual thermal energy from said exhausted mixture of first and second working fluids to said incoming working fluid water to thereby preheat the same to water vapor prior to its introduction within said chamber;

means for diverting water vapor from said chamber, if desired, for co-generated process steam; and wherein the improvement comprises:

means for operating the engine under partial load conditions such that when substantially no co-generated process steam is required, the engine control path follows a locus of peak efficiency points resulting in declining TIT as the load decreases, and such that XMIX and SHIR are selcted so that for a given value of TIT, XMIX is at or near XMIX peak, where XMIX peak occurs when the following conditions are both met simultaneously:

(i) the temperature of the water vapor is substantially maximized; and

(ii) the effective temperature of said exhausted mixture of the first and second working fluids is substantially minimized; and

means for operating the engine to produce co-generated process steam by following a control path which reduces

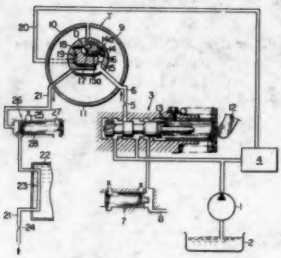
the steam flow rate to said chamber as process steam increases.

4,680,928

WARM-UP PROMOTION DEVICE FOR AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo, and Takashi Aoki, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,036
Claims priority, application Japan, Jul. 3, 1982, 57-115680
Int. Cl.[4] F16D *31/00*
U.S. Cl. 60—329 **2 Claims**



1. In an automatic transmission having a torque convertor, an inlet passage connecting between an oil inlet of said torque convertor and an outlet of a hydraulic pump driven by an engine, and an outlet passage connecting between an oil outlet of said torque convertor and an oil tank, said outlet passage being independent and separate from said inlet passage and being provided at an intermediate portion thereof with an oil cooler,

a warm-up promotion device for the automatic transmission, comprising: a by-pass passage branched from said outlet passage at a portion upstream of said oil cooler and leading to said oil tank while bypassing the oil cooler: and a by-pass valve associated with said by-pass passage and adapted to open said by-pass passage during warming up of said automatic transmission; wherein said by-pass valve is a pressure-response type valve which is adapted to open said by-pass passage in response to a pressure rise in said outlet passage caused by an increase in the viscosity of the oil discharged from said torque convertor, thereby allowing the oil to be returned to the tank while bypassing the oil cooler.

4,680,929

SWIVELLING WORKING VEHICLE

Akihiko Mouri, Sakai, and Kazushige Ikeda, Osaka, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 14, 1983, Ser. No. 561,440
Claims priority, application Japan, Apr. 4, 1983, 58-49852[U]; Jul. 21, 1983, 58-134987
Int. Cl.[4] F16D *31/00*
U.S. Cl. 60—368 **5 Claims**

1. A working vehicle capable of swivelling comprising:

a swivel base (2) having a working implement (6),

a hydraulic motor (3) for swivelling the swivel base,

an actuator valve (10) for controlling the hydraulic motor in opposite directions and stopping the hydraulic motor,

an angle sensor (18) for detecting an angle of the swivel base relative to the vehicle body,

a setting adjuster (19) for setting a stopping position (θf) of the swivel base relative to the vehicle body,

detector means (17) for detecting operating conditions of the actuator valve,

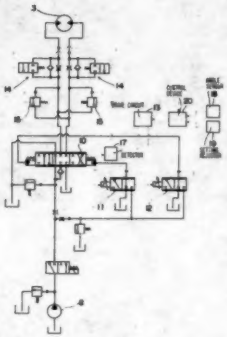
said actuator valve including flow control valve means for controlling flow rate of hydraulic oil supplied to the hydraulic motor,

forward and reverse braking valves (14) which prevent a momental rotation of said swivel base when in a stationary position,

forward and reverse relief valves (15) for cushioning said swivel base during stopping, and

control means (20) adapted to receive signals from the angle sensor, the setting adjuster and the detector means and to transmit signals to the actuator valve and to the flow control valve to swivel the swivel base at a predetermined speed,

said control means having a first swivel speed computing function to provide a first speed accelerated with swivelling of the swivel base,



a second swivel speed computing function to provide a second speed decelerated as the swivel base approaches a stopping position,

a third swivel speed computing function to provide a third, predetermined constant speed as a maximum permissible speed over an entire swivel range of the swivel base,

a swivel speed setting function to set the slowest swivel speed at an angular position of the speeds provided by the first to third computing functions to be the swivel speed for that angular position, and

an overrun correcting function to provide a correcting swivel speed for returning to the stopping position when an overrun of the swivelling is detected.

4,680,930

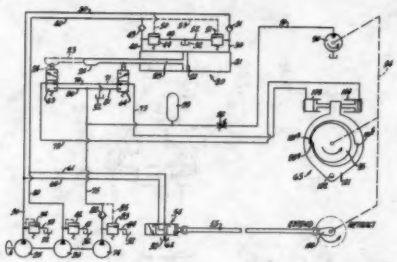
HYDRAULIC CONTROL CIRCUIT AND VALVE ASSEMBLY

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 5, 1983, Ser. No. 558,050
Int. Cl.[4] F15B *15/18*
U.S. Cl. 60—375 **30 Claims**

1. A hydraulic power and control system for operating a hydraulic reciprocating mechanism comprising: hydraulic fluid supply means; fluid direction control means for selectively directing hydraulic fluid from said supply means to said reciprocating mechanism to reciprocate a member of said mechanism between a first position and a second position; said fluid direction control means having a first position directing hydraulic fluid to move said member in one direction and a second position directing hydraulic fluid to move said member in the other direction; reversing means for shifting said fluid direction control means between its first and second positions; a continuous torque hydraulic motor operatively connected to said reversing means; an escapement releasably coupled with said motor to restrain said motor from operating said reversing means while said member is intermediate said first and second positions; and means for releasing said motor from said escape-

ment responsive to arrival of said member at said first and at said second positions allowing said motor to operate said reversing means and shift said fluid direction control means between said first position and said second position.

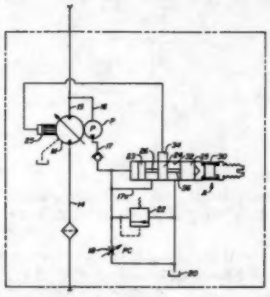


4,680,931

CONSTANT SPEED CONTROL FOR POSITIVE DISPLACEMENT VARIABLE STROKE HYDRAULIC MOTOR

Harvey C. Jacobs, 9710 Harvard St., Bellflower, Calif. 90706

Continuation of Ser. No. 132,044, Mar. 30, 1980, abandoned.
This application Mar. 24, 1983, Ser. No. 476,819
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—447 4 Claims



1. A control mechanism for at least one positive displacement variable stroke motor connected across a pressure drop in a hydraulic line supplied with fluid under pressure by a prime mover, said control mechanism comprising:

a positive displacement pump connected to the shaft of said motor, said positive displacement pump having a fluid circuit independent of said pressure drop and connection to said prime mover with a discharge across an orifice to provide a control pressure between said pump and said orifice varying responsive to the speed of said motor;

a fluid amplifier for amplifying the control pressure, said fluid amplifier having an output; and

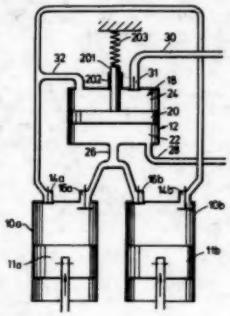
means for varying the stroke of said motor communicated to said fluid amplifier responsive to the output of said fluid amplifier.

4,680,932

APPARATUS FOR SUPERCHARGING AN INTERNAL COMBUSTION ENGINE

Oskar Schatz, Tellhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Continuation of Ser. No. 609,928, May 14, 1984, abandoned.
This application Apr. 28, 1986, Ser. No. 856,797
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318093; May 18, 1983, 3318094
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—605 2 Claims



1. The combination of an internal combustion engine and a positive displacement supercharger, said engine of the type having at least two cylinders having a reciprocating piston movable between top dead center and bottom dead center positions comprising:

said positive displacement supercharger having a housing defining a chamber and a single movable piston therein dividing said chamber into an exhaust gas chamber and an air charging chamber, said exhaust gas chamber and said air charging chambers communicating with both of said engine cylinders such that in a first operational occurrence of said supercharger, exhaust gases in said exhaust gas chamber from the first of said cylinders bias said supercharger piston to compress air in said air charging chamber such that air is directed to the second of said cylinders when said piston of said second cylinder is moving between said top dead center and said bottom dead center position and in a second operational occurrence of said supercharger, exhaust gases in said exhaust gas chamber from said second of said cylinders bias said supercharger piston to compress air in said charging chamber such that air is directed to said first cylinder when said piston of said first cylinder is moving between said top dead center and said bottom dead center positions, said first and second operational occurrences alternating during operation of said supercharger, and said exhaust gas biasing being timed to provide compressed air to said cylinders at a point where said piston cylinders are near said bottom dead center position.

4,680,933

CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS TURBOCHARGER

Hanns-Günther Bozung, Neusäss, and Joachim Nachtigal, Hetzles, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

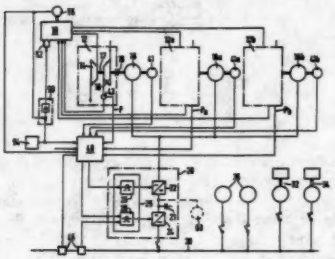
Filed Oct. 7, 1985, Ser. No. 785,283
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437872
Int. Cl.[4] F02B *33/44*
U.S. Cl. 60—608 18 Claims

1. A control device for an internal combustion engine with an exhaust gas turbocharger having an exhaust gas turbine and

a compressor both mounted on a common shaft, which can be driven by an electric motor, said turbine transferring the electric motor from motor operation to generator operation in the event of excess power in the exhaust gases so as to furnish electrical energy from the electric motor to an electric accumulator, or an independent load, via a static converter, comprising:

(a) a plurality of sensors that detect the instantaneous values of (a) the actual rotary speed of the turbocharger, (b) the actual voltage of the electric accumulator, (c) the actual frequency of the electric accumulator, and (d) the actual charging air pressure of the compressor; and

(b) a computer controller which (a) receives as control data the detected values from the plurality of sensors, a control input received by a controller of the internal combustion engine, and engine output data, and (b) computes and supplies from the control data received and from stored values, in particular, from a charging air pressure characteristic or from an input characteristic to the electric motor as a function of the output of the internal combustion engine, control signals for the static converter by



which, in the motor-operating mode of the electric motor, the internal combustion engine accelerates as quickly as possible at combustion air ratios optimal for low-smoke combustion, and by which, in the generator-operating mode of the electric motor, a maximum yield of electrical energy from the excess exhaust gas energy can be fed to the electric accumulator or to the independent load, the transferring of the electric motor from motor operation to genertor operation and vice versa being controlled as a function of a charging air pressure value preset in the computer controller and the computer controller being usable in conjunction with an exhasut gas turbocharger which, due to optimized exhaust gas turbine and compressor blade design, is of such high efficiency that it is not necessary to utilize the entire amount of exhaust gas available for generating the amount of charging air required in the upper load range of the internal combustion engine, with the charging air pressure required for an optimum combustion air ratio, and that the exhaust gas energy attainable without increased fuel intake can be utilized for conversion into electrical energy.

4,680,934

BOILER FOR A TORPEDO AND SYSTEM INCLUDING THE SAME

Keith E. Short, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 4, 1986, Ser. No. 892,178

Int. Cl.[4] F01K *13/02*

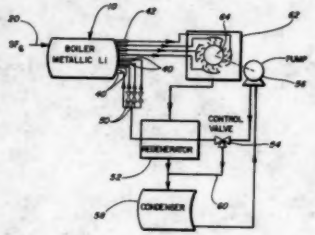
U.S. Cl. 60—652 **12 Claims**

1. A boiler for use in a torpedo or the like and comprising:

a housing containing a fuel which, when oxidized, will generate heat, said housing having an interior wall defining a chamber;

at least one oxidant inlet in said housing and extending to said chamber;

a plurality of working fluid conduits each having an inlet and an outlet exterior of said housing and a heat exchange section within said chamber, each said heat exchange section comprising a plural convolution coil, the individ-



ual convolutions of each conduit being interleaved with the individual convolutions of the other conduits; and

means for controlling the flow of working fluid through at least some of said conduits independently of the others.

4,680,935

CRYOGENIC CONTAINER

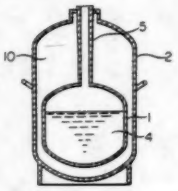
Takashi Murai, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 30, 1986, Ser. No. 868,438

Claims priority, application Japan, May 31, 1985, 60-82739[U]

Int. Cl.[4] F17C *1/00*

U.S. Cl. 62—45 **5 Claims**



1. A cryogenic container comprising:

an inner tank containing a cryogen;

an outer tank housing said inner tank and having an insulating medium between said inner tank and said outer tank; and

a pipe connecting the inside of said inner tank and the outside of said outer tank, said pipe providing the main support of the weight of said inner tank and cryogen contained therein;

the cryogen within said inner tank generating a temperature gradient in said connecting pipe in the longitudinal direction thereof which provides a progressively increasing strength of material from which said connecting pipe is formed as the temperature of the material lowers from an outer portion near the outer tank to a portion connected to said inner tank;

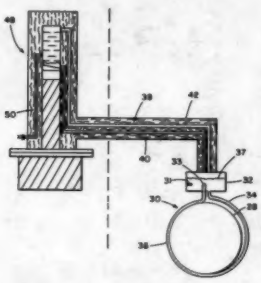
said pipe having a smaller heat-conducting cross-sectional area at the portion connected to said inner tank than the cross-sectional area at the outer portion to reduce heat conduction along said pipe;

said smaller heat-conducting cross-sectional area of said pipe providing a strength sufficient to support the weight of the inner tank and anything contained therein, including cryogen.

4,680,936
CRYOGENIC MAGNET SYSTEMS

Raymond E. Sarwinski; John R. Purcell, both of San Diego; Judson W. Parker, Escondido, and Sibley C. Burnett, San Diego, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Dec. 24, 1985, Ser. No. 813,175
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—45 **2 Claims**



1. A cryogenic superconducting magnet system for use in magnetic resonance imaging (MRI) devices, said system comprising:

an evacuated container,

a first tank mounted within said evacuated container and thermally insulated therefrom,

boiling liquid helium disposed in said first tank and exhausted to the outside of said container,

a cryogenic superconducting magnet disposed in said first tank,

a metallic heat radiation shield disposed in said evacuated container and substantially surrounding said first tank, said shield being thermally insulated from both said container and said first tank, and

a neon refrigeration system external to said shield for cooling said shield, said neon refrigeration system including neon refrigerant, a second tank for containing said neon refrigerant in its liquid state, at least one thermal siphon for circulating said neon refrigerant by convection from said second tank to said shield, the boiling of said neon refrigerant at said shield acting to circulate said neon refrigerant in said thermal siphon and cool said shield, a mechanical cryocooler remote from said container for condensing said neon refrigerant from the gaseous to the liquid state, and thermally insulated transfer means for transferring said neon refrigerant in its gaseous state from said second tank to said cryocooler and said neon refrigerant in its liquid state from said cryocooler to said second tank.

4,680,937
AUTOMATIC FUEL TANK ANTI B.L.E.V.E. SAFETY APPARATUS AND SYSTEM

Colin G. Young, 1368 Glen Rutley Circle, Mississauga, Canada (L4X 1Z6)

Filed Mar. 3, 1986, Ser. No. 835,761
Claims priority, application Australia, Mar. 5, 1985, PG9562
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 **7 Claims**

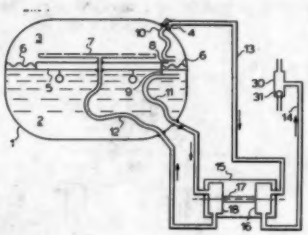
1. An automatic safety apparatus for use in a closed vessel for containing both liquified and vapourized gas of a liquifiable gas having a boiling point below the ambient temperature at atmospheric pressure, wherein the vessel has an interior and at least one pressure relief valve comprising:

a pumping means for pumping the liquified gas;

first connecting means between the pumping means and the at least one relief valve to provide gaseous communication between the pumping means and the at least one relief valve;

spraying means to be positioned in the portion of the interior of the vessel containing the vapourized gas and adapted to spray upwardly onto the vessel;

a second connecting means for fluid passage between the pumping means and the spraying means;

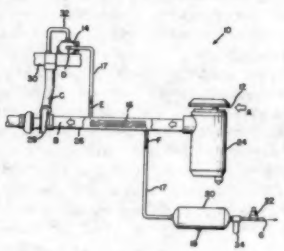


wherein the pumping means is caused to pump the liquified gas through the second connecting means to the spraying means by movement of the vapourized gas which passes through the pumping means either before or after passing through the relief valve.

4,680,938
AIR DRYING SYSTEM FOR PNEUMATIC CIRCUITS

Douglas A. Caley, King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed May 8, 1985, Ser. No. 732,227
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—93 **10 Claims**



8. An air drying system for use in a vehicle having an internal combustion engine and air serviced devices including air brakes, which are part of a pneumatic circuit operting at a working pressure substantially above normal atmospheric pressure and having portions exposed to ambient conditions wherein the engine draws engine intake air approximately at ambient temperature comprising:

means for compressing a small portion of the drawn engine intake air to a high pressure, substantially greater than the working pressure of the pneumatic circuit;

means for transferring sufficient heat energy from the highly compressed air to the engine intake air to cool the highly comressed air below the dew point thereof and approximately to ambient temperature to condense water out of the highly compressed air;

means connected to the heat energy transferring means for removing the condensed water from the system; and

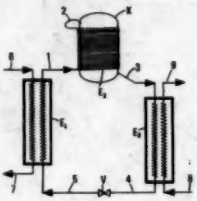
means for expanding the cooled, highly compressed air to the working pressurse of the pneumatic circuit to suppress the dew point thereof substantially below ambient temperature.

4,680,939

PROCESS FOR PRODUCING HEAT AND/OR COLD BY MEANS OF A COMPRESSION ENGINE OPERATING WITH A MIXED WORKING FLUID

Alexandre Rojey, Garches, and Claude Ramet, Nanterre, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 28, 1985, Ser. No. 738,218
Claims priority, application France, May 28, 1984, 84 08633
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—114 11 Claims



1. In a process for the extraction of heat from a first fluid to cool the fluid and for the addition of heat to a second fluid to heat the second fluid, wherein the process utilizes a working fluid; a compressor for compressing the working fluid; the compressor being in a hermetic container and having a suction zone and a discharge zone; a first heat exchanger for thermally contacting the first fluid with the working fluid to cool the first fluid and to add heat to the working fluid for vaporizing the working fluid; a second heat exchanger for thermally contacting the second fluid with the working fluid to heat the second fluid by removing the heat from the working fluid for condensing the working fluid, and an expansion valve for cooling the working fluid, the improvement comprising the steps of:

(a) composing the working fluid of at least two non-azeotropic components:

(b) passing the condensed working fluid through the first heat exchanger to partially vaporize said condensed working fluid and to produce a liquid-vapor mixture;

(c) thermally contacting the liquid-vapor mixture of step (b) with the hermetic container surround the compressor at a point in proximity with the suction zone and circulating the mixture in a sealed path around the container while progressively flowing the mixture nearer to the discharge zone and discontinuing contact of the mixture with the container at a location relatively near the discharge zone to extract heat from the compressor and to continue vaporization of the liquid-vapor mixture to produce a finally vaporized mixture;

(d) compressing the finally vaporized mixture of step (c) while extracting heat from the compressor as recited in step (c) to produce a compressed mixture;

(e) thermally contacting the second fluid with the compressed vaporized mixture in the second heat exchanger to heat the second fluid and condense the compressed mixture so as to produce a condensed mixture;

(f) expanding the condensed mixture, and

(g) performing step (b)–(f) cyclically using the working fluid mixture of step (a).

4,680,940

ADAPTIVE DEFROST CONTROL AND METHOD

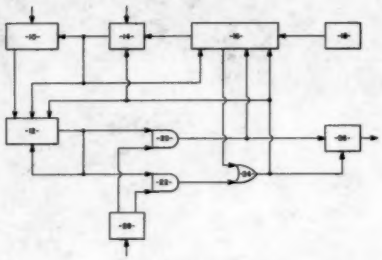
Eldon D. Vaughn, 1845 W. Skywood St., Brea, Calif. 92621

Filed Jun. 20, 1979, Ser. No. 50,352
Int. Cl.[4] F25D 21/06
U.S. Cl. 62—155 3 Claims

1. A control mechanism for use with a refrigeration circuit having at least one heat exchanger upon which frost may accumulate, said frost being removed by supplying heat energy to melt the frost during a defrost cycle which comprises

a defrost time accumulator to ascertain the elapsed time during a defrost cycle,

timing means for controlling the time interval between defrost cycles including a clock which emits periodic pulses and a counter for initiating a defrost cycle when a predetermined number of pulses have been emitted by the clock, and



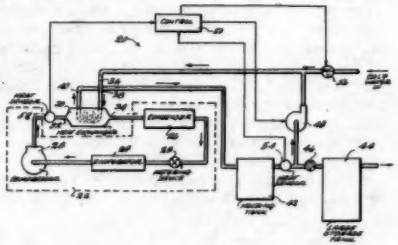
rate of control means for adjusting the timing means to vary the time interval between defrost cycles as a function of the elapsed time of the previous defrost cycle ascertained by the defrost time accumulator, said rate control means being connected to the defrost time accumulator and acting based upon the length of the previous defrost cycle stored in the accumulator to vary the pulse emission rate of the clock.

4,680,941

WASTE HEATING RECOVERY SYSTEM

Elvet M. Richardson, 18 Marshall St., Irvington, N.J. 07111, and Teik P. Sim, 144-45 Charter Rd., Jamica, N.Y. 11435

Filed May 21, 1986, Ser. No. 865,404
Int. Cl.[4] F25B 39/04
U.S. Cl. 62—184 2 Claims



1. An apparatus for recovering waste heat from a refrigeration system having a compressor, condensor and evaporator coupled together for circulating a refrigerant comprising:

heat exchanger means adapted to be connected to said system between said compressor and condensor and having an inlet for receiving said refrigerant from said compressor and an outlet for supplying said refrigerant to said condensor and a water line passing therethrough to which heat is transferred from said refrigerant, said water line being adapted to be connected at one end to a source of cold water;

a holding tank connected to the other end of said water line for receiving at an inlet water to which heat has been transferred and storing said water and having an outlet;

means connected to said holding tank outlet and adapted to be connected to a water storage tank having a capacity

greater than the capacity of said holding tank by means of one way valve means so that heated water flows from said holding tank to said storage tank when the pressure in said storage tank drops below the pressure in said holding tank upon removal of water from said storage tank; and

pump means connected between said holding tank outlet and connected to said heat exchanger means inlet by said water line for circulating heated water from said holding tank;

means for sensing the temperature of said refrigerant prior to passage through said heat exchanger;

means for sensing the temperature of said heated water prior to passage through said pump means;

solenoid valve means connected between said water line and said source of cold water; and

a central control unit means for causing said pump means to circulate water when either the temperature sensed by said refrigerant temperature sensing means is above a predetermined value, or the temperature sensed by said water temperature sensing means is below a predetermined value, and for opening said solenoid valve means when said pump means is not operating to circulate water.

4,680,942

CABINET FOR CUT-OFF FLOWERS

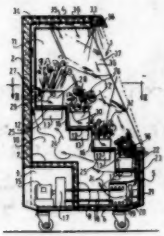
Hermen Kooy, 46, Stommeerkade, EK Aalsmeer, Netherlands

Division of Ser. No. 600,386, Apr. 16, 1984, Pat. No. 4,608,776, which is a division of Ser. No. 403,050, Jul. 29, 1982, Pat. No. 4,458,501. This application May 14, 1986, Ser. No. 863,006

Claims priority, application Netherlands, Jun. 16, 1982, 8202449

Int. Cl.[4] A47F *3/04*

U.S. Cl. 62—256 **11 Claims**



1. Apparatus for preserving cut flowers while on display comprising:

cabinet means including an upper portion spaced from a lower portion thereof to define a generally vertically extending viewing and access opening therebetween, said cabinet means having a display space and separate cooling space therein;

flower container means within said cabinet and having a body of water therein and an open upper end for receiving cut flowers with the stems thereof immersed in said water and the blooms thereof disposed in said display space;

cooling means for cooling air in said cooling space;

circulating means for forcibly recirculating air through said cooling space into said display space and thence back into said cooling space for cooling the flower blooms without subjecting the blooms to an intolerable draft of cooled air; and

means for supporting said flower container means within the cabinet so that the lower portion of the flower container means is below said display space and is in communication with cooled air in said cooling space to cool the water in the container means and thereby provide considerable cooling of the flowers having the stems thereof immersed in said water, the upper open end of the container means being in communication with the cooled air in said display space.

4,680,943

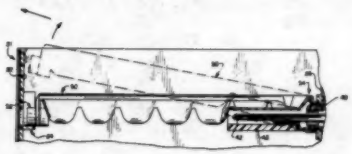
ICE MAKER

Harold S. Mawby, Belding, and Duane H. Harris, Gowen, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 722,135, Apr. 11, 1985. This application Apr. 24, 1986, Ser. No. 855,489

Int. Cl.[4] F25C *1/24*

U.S. Cl. 62—300 **2 Claims**



1. An automatic ice cube maker for use in the freezer compartment of a domestic refrigerator comprising:

a housing member having a generally open top and bottom defined by a front wall, a rear wall, and a pair of opposed sidewalls;

a compartmented ice tray having a top side constituted by a plurality of ice cube shaped pockets for receiving water to be frozen, the ice tray being horizontally mounted within the walls of the housing for rotary movement between an upright ice making position and an inverted ice dumping position, said ice tray being rotatable on a horizontal axis extending between said front and back walls of the housing;

an electrically energized drive means connected to the ice tray for moving the ice tray between its upright and inverted positions;

a control circuit for energizing the drive means; and

ice tray mounting means including a driven means constituted by an integral rearward portion of the ice tray, a drive shaft rotatably driven by the drive means, the drive shaft being rotatably mounted on a rear wall portion of the housing, one end of the drive shaft being engageable with the integral rearward portion of the ice tray, wherein rotation of the drive shaft applies a rotating force to the rearward portion of the ice tray, an integral front portion of the ice tray providing a cylindrical projection rotatably supported by a portion of the said front wall of the housing, said front portion of the ice tray being movable by the user out of engagement with said supporting portion of the housing front wall wherein the said rearward portion of the ice tray can then be manually disengaged from the said one end of the drive shaft to permit removal and cleaning of the ice tray at a location outside the said freezer compartment, said supporting portion being constituted by a U-shaepd flange extending horizontally from the front wall of the housing, the U-shaped flange having a shelflike base portion, and a pair of generally identical, parallel, upwardly extending leg portions spaced from each other along a major portion of the legnths by a distance slightly greater than the diameter of the said cylindrical projection, wherein said projection can move downwardly from the open top of said U-shaped flange between the spaced leg portions so as to rest on and be rotatably supported by the shelf-like base portion, said U-shaped flange including detent means for retaining the cylindrical projection in position on the said shelflike base portion, said detent means being constituted by a reduced width area of the vertical channel formed between said spaced leg portions, the distance between said leg portions at said reduced width area being slightly less than the

diameter of said cylindrical projection, said cylindrical projection being snapped downwardly past said reduced width area so as to rest on and be rotatably supported by the shelflike base portion of the flange.

4,680,944

APPARATUS FOR THE PREPARATION OF ICE CREAM, MILKSHAKES, SORBET, FROZEN DESSERTS AND THE LIKE FROM A PUMPABLE STARTING MIXTURE

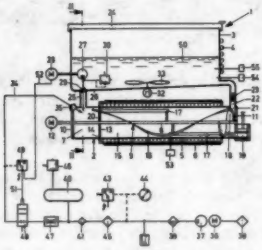
Waldemar Menzel, Kulmbach-Burghaig, Fed. Rep. of Germany, assignor to Lumen GmbH Nährmittel - und Maschinenfabrik, Kulmbach, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,728

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544802

Int. Cl.[4] A23G 9/12

U.S. Cl. 62—342 4 Claims



1. Apparatus for the preparation of ice cream, milkshakes, sorbet, frozen desserts, and the like, from a pumpable starting mixture, comprising:

a storage container for the starting mixture;

a supply conduit communicating with said storage container;

a cylinder for cooling or freezing, said cylinder communicating with said storage container via said supply conduit;

a rotatably drivable stirring and scraping mechanism disposed in said cylinder;

an inlet chamber located on one end of said cylinder, said supply conduit discharging into said inlet chamber;

a discharge valve located on the other end of said cylinder;

a heater for pasteurizing the starting mixture, said heater surrounding only said cylinder;

a thermostat for limiting the wall temperature of said cylinder;

means for transporting the starting mixture from said inlet chamber to said discharge valve; and

a connecting conduit having a valve therein, said connecting conduit being disposed between said cylinder, at the end thereof adjacent said discharge valve, and said storage container.

4,680,945

COOLING CHAMBER FOR PROCESSING SPECIMENS FOR MICROSCOPIC AND ELECTRON-MICROSCOPIC INVESTIGATIONS

Dietrich Hoffmeister, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed May 14, 1986, Ser. No. 863,194

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517518

Int. Cl.[4] F25B 19/00

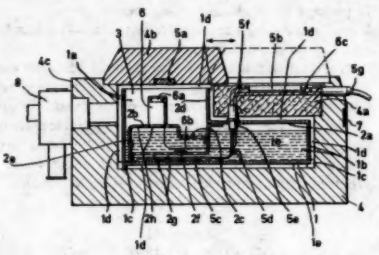
U.S. Cl. 62—514 R 10 Claims

1. A cooling chamber for processing a specimen for microscopic and electron-microscopic investigations comprising:

an insulating vessel having an inner wall surface defining a receiving cavity;

coolant vessel means for holding a coolant therein disposed in said cavity and having an outer wall surface adjacent said inner wall surface;

a working chamber for processing the specimen, said working chamber being arranged above said coolant vessel means and having a base defining an apertured interface between the interior of said coolant vessel means and said chamber so as to permit vaporous coolant to pass from



said coolant vessel means into said working chamber thereby filling the latter;

a plurality of spacers arranged at preselected locations between said wall surfaces for supporting said coolant vessel means in spaced relationship to said inner wall surface so as to cause said wall surfaces to conjointly define a space therebetween for thermally insulating said coolant vessel from said insulating vessel; and,

coolant supply means for supplying vaporized coolant to said work chamber.

4,680,946

FLAT-BED KNITTING MACHINE HAVING A SPOOL TABLE

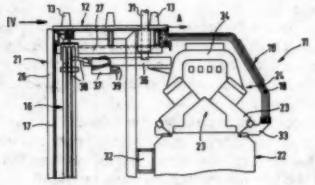
Adam Müller, and Ernst Goller, both of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 890,264

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528695

Int. Cl.[4] D04B 7/26

U.S. Cl. 66—64 23 Claims



1. A flat-bed knitting machine, comprising:

a needle bed apparatus;

a carriage apparatus;

an operating panel including control cables therefore;

a protective cover;

a trailing cable device; and

a spool table disposed in the rear area of the machine above the needle bed apparatus and the carriage apparatus, said spool table having a plurality of yarn spool holders disposed thereon, wherein;

the spool table comprises one or more interconnected extruded profile elements each having a top and bottom

region with the top region having integrated securing means defined therein for detachably securing the yarn spool holders, and with the bottom region having guide recesses extending along the longitudinal extent of the spool table for receiving at least one of the protective cover, the operating panel and the trailing cable device.

4,680,947

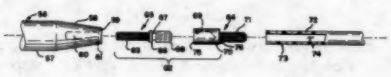
INTERCHANGEABLE KNITTING NEEDLE SYSTEM

Cornelius M. Phipps, Sr., and Cornelius M. Phipps, Jr., both of Glen Ellyn, Ill., assignors to Plastic Specialties, Inc., Glen Ellyn, Ill.

Continuation-in-part of Ser. No. 736,867, May 22, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 879,206

Int. Cl.[4] D04B *35/02*

U.S. Cl. 66—117 **25 Claims**



1. An interchangeable knitting needle system comprising at least one knitting needle having a tip, a shaft extending therefrom and terminating at a tip-opposite base, said tip-opposite base associating with cable connector means, said connector means comprising a two-member coupling assembly including a coupling member having an insert pin end integrally formed with a needle shaft and extending inwardly from said base and an engageable threaded stem portion extending outwardly from the base, and a connecting member including a barrel portion having an axial threaded bore at one end thereof, the axial bore being thread-engabeable with the stem portion of the coupling member and extending from the opposite end of the barrel portion, said connecting member having a coupling stem means capable of engageable insertion at the end of a hollow flexible cable; and, at least one hollow flexible cable capable of receiving looped knitted material thereon upon the engagement at one end thereof with said coupling stem means of said connecting member, said cable connector means and flexible cable being capable of repetitive engagements and disengagements.

4,680,948

DRYER MOUNTING BRACKET ASSEMBLY

Raymond W. Rummel, Webster City, and Anthony A. Crystal, Stratford, both of Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 10, 1985, Ser. No. 690,314

Int. Cl.[4] D06F *37/20*

U.S. Cl. 68—3 R **20 Claims**

1. A bracket assembly to provide for vertical mounting of a top appliance having a base and two vertical side surfaces and a bottom appliance having a top horizontal surface and two vertical side surfaces and a vertical back surface, comprising two mounting brackets each having:

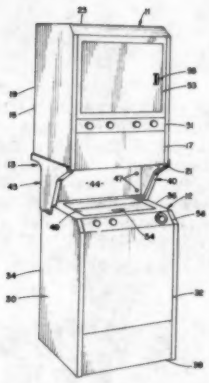
a lower flange having a bottom side which defines a lower mounting surface to engage the top horizontal surface of the bottom appliance;

a lower leg extending integrally downward from the lower flange and forming a lower inside face to engage the adjacent side surface of the bottom appliance, said lower inside face being substantially perpendicular to said lower mounting surface and joining the lower mounting surface to form a lower horizontal angle;

a back rib extending integrally downward from the lower flange and forming a back inside face to engage the vertical back surface of the bottom appliance, said back inside face being substantially perpendicular to the lower inside face of the leg and joining said lower inside face to form a lower vertical angle;

an upper flange having a top side which defines an upper mounting surface to engage the base of the top appliance;

an upper leg extending integrally upward from the upper flange and having an inside face to engage the adjacent vertical side surface of the top appliance, said upper face



being substantially perpendicular to said upper mounting surface and joining the upper mounting surface to form an upper horizontal angle; and

supporting means joining the upper flange to the lower flange in a spaced parallel relationship and being capable of supporting the top appliance.

4,680,949

LOCKING DEVICE FOR ARTICLES SUCH AS SAILBOARDS

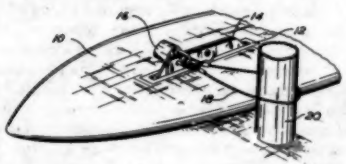
Leo J. Stewart, 123 Pine Street, Hudson, Quebec, Canada

Filed Apr. 22, 1986, Ser. No. 854,841

Claims priority, application Canada, Feb. 24, 1986, 502520

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—14 **26 Claims**



1. A locking device for the securing against unauthorized removal of an article of manufacture of the type having an elongated groove therein said groove having an elongated re-entrant channel in at least one elongated side wall of the groove for receiving one or more locking pins therein, said groove also having a widened section therein defining an entry/exitway leading into said elongated re-entrant channel from the exterior of said article, said locking device comprising a pair of relatively movable rigid members, at least one of said members having a locking pin therein and said at least one member and said locking pin therein being adapted to enter into said groove via said entry/exitway with said locking pin projecting outwardly from said at least one member in a direction relative to said at least one member as to enable said locking pin to project into and to engage in said re-entrant channel in said elongated side wall of said groove when said at least one member is disposed within said groove, and the other of said members adapted to be locked in a selected position

with respect to said one member, such that said at least one member can be securely retained within said groove.

4,680,950

METHOD OF AND AN APPARATUS FOR FORMING TENSION SPRINGS WITH GERMAN TYPE HOOKS

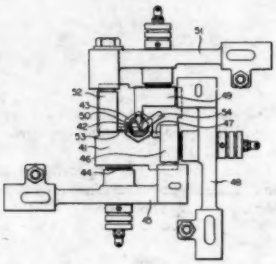
Yozo Ohdai, Kasugai; Norifumi Abiru, Owariasahi, and Eiji Ohbayashi, Kuwana, all of Japan, assignors to Asahi-Seiki Manufacturing Co., Ltd., Japan

Filed Mar. 28, 1986, Ser. No. 845,550

Claims priority, application Japan, Apr. 3, 1985, 60-70616

Int. Cl.[4] B21F *35/02*

U.S. Cl. 72—130 3 Claims



2. A method of forming German type hooks on a tension spring, in which a first hook, a body coil and a second hook are successively formed to provide a tension spring by means of forming tools provided on ends of rocker arms controllably swung about axes perpendicular to and offset from a central axis of a wire guide and relative to a length of wire stock advanced in front of said wire guide by means of a pair of feed rolls, said method comprising the steps of: forming a first hook with a contiguous linear portion thereon, temporarily suspending the feeding of the wire stock advancing a second forming tool and forming approximately a one fourth of an initial turn of the body coil contiguous to said linear portion after the first hook and its contiguoug linear portion are formed; advancing a third forming tool and twisting a coil portion having said one fourth of an initial turn to thereby displace a starting point of a body coil to a position offset from a forming plane of a body coil while interposing said coil portion between the third forming tool and a stationary abutment tool; advancing a first forming tool and bending the linear portion of said first hook by more than 90 degrees toward said forming plane of the body coil at a point where said coil portion is interposed between the third forming tool and the abutment tool; withdrawing all of said tools from said formed first hook to effect turning of the linear portion thereof 90 degrees relative to said starting point of said body coil due to the influence of a torsional righting moment created by the twist induced in the wire stock extending from a point where it is interposed between said feed rolls, and a spring back force induced after the bending by more than 90 degrees, to form a German type hook which extends substantially perpendicular to the surface of the body coil advancing a second forming tool into contact with said wire stock while continuously feeding said stock to form a body coil; and then forming a second German type hook on an opposite end of said body coil.

4,680,951

METHOD FOR DRESSING HOT ROLLED STRIP COILS, ESPECIALLY COILBOX COILS

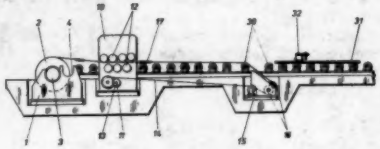
Reiner Brach, Mülheim, Fed. Rep. of Germany, assignor to Reiner Brach Import-Export, Mülheim, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,399

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423760; Aug. 1, 1984, 3428349; Apr. 17, 1985, 3513831

Int. Cl.[4] B21D *3/04*

U.S. Cl. 72—160 14 Claims



1. A method of dressing coils of thick hot rolled strips, especially a coilbox coil; said method comprising the steps of:

placing said coil in a coil support frame and rotatably supporting said coil about its axis in said coil support frame such that said coil support frame takes up traction forces which act upon said hot strip;

securing a traction means of a traction device to the end of said hot strip at the beginning of said coil;

at least partially uncoiling said hot strip from said coil by means of said traction means without necessity for any additional drive and energy expenditure for this purpose and without any appendages being secured thereto;

introducing the thus uncoiled beginning of said hot strip into a roller truing machine until there is grasping of said hot strip by the truing rolls of said roller truing machine and accompanied by drawing of said hot strip into the roller truing machine; and

providing said roller truing machine with a drive mechanism; extending said traction means through said roller truing machine from the inlet side to the outlet side thereof between said truing rolls thereof; and drawing said traction means through said roller truing machine with the aid of said drive mechanism, whereby the beginning of said hot strip is unwound from said coil and drawing of said strip proceeds into said roller truing machine.

4,680,952

PROCESS AND APPARATUS FOR THE PRODUCTION OF STRANDS FOR BOWDEN CABLES

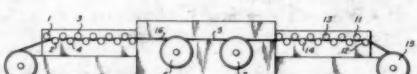
Karl Burghoff, Oberursel; Werner Schiller, Erzhausen; Wilhelm Albrecht, Vaihingen; Herbert Harsch, Waiblingen-Bickenfeld, and Heinz-Georg Burghoff, Reichenbach, all of Fed. Rep. of Germany, assignors to Max Kammerer GmbH, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,634

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405693

Int. Cl.[4] B21D *1/02*; B21C *19/00*

U.S. Cl. 72—161 11 Claims



1. Process for treatment of strands for Bowden cables comprising:

dressing a plurality of twisted wire strands between a first set of reversing rollers;

stretching said dressed strands; and

dressing said stretched strands between a second set or reversing rollers.

4,680,953

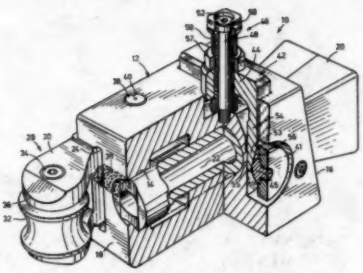
ROLLER ENTRY GUIDE RELATING TO A ROD MILL

Mario Fabris, Grimsby, Canada, assignor to Fabris Industrial Manufacturing Limited, Winona, Canada

Filed Oct. 9, 1985, Ser. No. 785,719

Int. Cl.[4] B21B *39/16*

U.S. Cl. 72—250 6 Claims



1. A roller entry guide to guide material along a longitudinal axis, said guide comprising:

a body;

a pair of generally parallel roller assemblies pivotally mounted on said body for rotation about a vertical axis, each of said roller assemblies being located on an opposite side of said longitudinal axis to define a passageway for material moving along said axis and including at least one roller rotatably attached thereto;

a yoke acting between the roller assemblies and said body, said yoke having a central portion with a pair of legs, one of said legs being disposed at each end of said central portion, said legs having tapered portions at the ends thereof which are operable on respective roller assemblies said legs being supported by said body; and

adjustment means operable on said yoke to raise or lower said yoke to induce conjoint rotation of said roller assemblies about a vertical axis, thereby causing said rollers to move simultaneously and to equal and opposite distances towards or away from said longitudinal axis.

4,680,954

GRIPPING DEVICES IN IDLING STAGE AREAS OF A TRANSFER PRESS

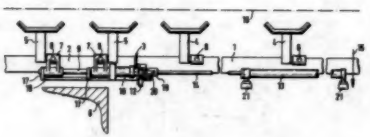
Sieghard Mueller, Ottenbach; Hermann Braun, Eislingen; Helmut Dumschat, Donzdorf, and Hans-Juergen Trautwein, Goeppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,277

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510697

Int. Cl.[4] B21D *43/05*

U.S. Cl. 72—405 3 Claims



1. A transfer press for transferring workpieces to successive workstations, and having idling stage areas between workstations, comprising:

gripper rail means for transmitting a transfer movement in a longitudinal direction onto the workpieces, said gripper rail means being subdivided at a separating area into interchangeable gripper rail partial sections and gripper rail partial sections, said interchangeable gripper rail partial sections having first gripper means fixed thereto for gripping the workpieces;

gripper arm mounting means on said gripper rail means and displaceable in said longitudinal direction into the idling stage area of the transfer press:

adjusting means on said gripper rail means for movably adjusting the gripper arm mounting means in said longitudinal direction over said separating area;

second gripper means for gripping the workpieces pivotally supported on the gripper arm mounting means for pivoting about an axis extending in said longitudinal direction;

rotary adjusting drive means secured to the gripper arm mounting means, for pivoting the gripper means about said axis;

said adjusting means moving, at the same time, said gripper arm mounting means, said rotary adjusting drive means and said second gripper means over said separating area back and forth between said interchangeable gripper rail partial section and gripper rail partial section.

4,680,955

DIE EXCHANGE DEVICE

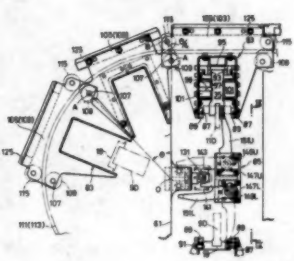
Katsuyoshi Sakamoto, Isehara, Japan, assignor to Amada Company, Limited, Japan

Filed Apr. 4, 1985, Ser. No. 720,014

Claims priority, application Japan, Apr. 7, 1984, 59-51091[U]; Apr. 9, 1984, 59-69189

Int. Cl.[4] B21J *13/08*

U.S. Cl. 72—462 6 Claims



1. A die exchange device comprising:

a frame having first and second side plates disposed in said frame, each of said side plates having an inside surface;

a first annular guide rail mounted on the inside surface of said first side plate;

a second annular guide rail mounted on the inside surface of said second side plates and spaced a distance apart from first annular guide rail;

a first number of link members supported on said first annular guide rail and pivotally linked to one another to form a ring along said first annular guide rail, said first number of link members having an inner side with respect to said first annular guide rail;

a second number of link members supported on said second annular guide rail and pivotally linked to one another to form a ring along said second annular guide rail, said second number of link members having an inner side with respect to said second annular guide rail;

a rack attached to each of said first and second number of link members;

a first pinion member supported on said first side plate

adapted to engage said racks on said first number of link members;

a second pinion member supported on said second side plate adapted to engage said racks on said second number of link members;

means supported on said frame for rotating said first and second pinion members to drive said first and second link members around said first and second guide rails, respectively; and

a number of die holders, each having a length substantially equal to the distance between said first and second annular guide rails, each of said die holders being mounted on the inner side of one of said first link members with respect to said first annular guide rail and on the inner side of one of said second link members with respect to said second annular guide rail.

4,680,956

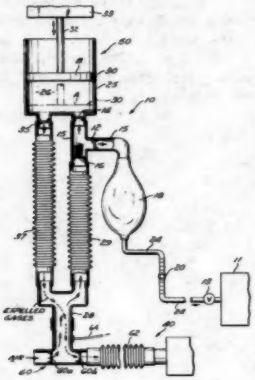
RESPIRATORY ANALYZER CALIBRATION APPARATUS WITH CONTROLLED RESPIRATORY GAS EXCHANGE SIMULATION

Andrew R. Huszczuk, Long Beach, Calif., assignor to Research and Education Institute, Inc. Harbor-UCLA Medical Center, Torrance, Calif.

Division of Ser. No. 552,615, Nov. 17, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 842,924

Int. Cl.[4] G01N *33/497*; G01D *25/00*

U.S. Cl. 73—1 G **11 Claims**



1. Apparatus for simulating the respiratory cycle of a biological subject which comprises:

a piston chamber;

a piston slidably movable within said piston chamber;

power means for moving said piston within said piston chamber in a reciprocal forward and backward cycle of movement, each complete cycle of movement of said piston corresponding to an inhalation phase and an exhalation phase of a single respiratory cycle;

a first container means adapted to contain calibration gas;

a first conduit means;

a first valve means for introducing, via said first conduit means, a known volume of said calibration gas to said piston chamber from said first container means during said inhalation phase of each of said cycle of piston movement;

a second conduit means;

a second valve means for introducing, via said second conduit means, a known volume of air to said piston chamber for admixture with said calibration gas, in said piston chamber during said inhalation phase of each said cycle of piston movement, both said calibration gas and air introduced into said piston chamber during said inhalation phase, simulating inhalation and a given metabolic rate;

a third valve means for expelling said admixed air and calibration gases from said piston chamber during said exhalation phase of said cycle of piston movement, said expelling of said gases simulating exhalation and a predetermined metabolic rate; and

a third conduit means for communicating said expelled gases, resulting from a series of complete cycles of movement of said piston, into a respiratory analysis system for calibration and adjustment of said respiratory analysis system with reference to the known compositions and volumes of gas expelled from said piston chamber.

4,680,957

NON-INVASIVE, IN-LINE CONSISTENCY MEASUREMENT OF A NON-NEWTONIAN FLUID

Stephen C. Dodd, Thorndale, Pa., assignor to The Davey Company, Jersey City, N.J.

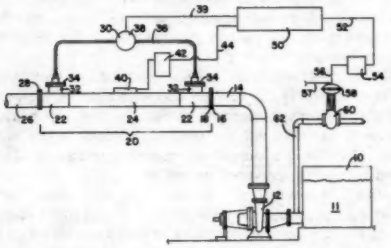
Filed May 2, 1985, Ser. No. 729,687

Int. Cl.[4] G01N *11/08*

U.S. Cl. 73—55 **20 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 18 Pages)



18. An apparatus for controlling the consistency of a liquid comprised of at least two components and which simulates a non-Newtonian fluid when flowing in a substantially laminar condition through a conduit of a given cross-sectional configuration, comprising:

(a) means for flowing said liquid in a substantially laminar condition through the conduit of a given cross-sectional configuration,

(b) means for measuring the bulk velocity of said fluid as it flows through said conduit,

(c) means for measuring any change in the pressure of the fluid in said conduit as said fluid flows between two points spaced a distance L from each other,

(d) means for adjusting the level of a component in the liquid to thereby control the consistency of the liquid in response to the formula:

$$C = \left(\frac{\Delta P}{2aL}\right)^{\frac{1}{\beta}} \frac{R^{\frac{n+1}{\beta}}}{\langle V_z \rangle^{n/\beta}} \left(\frac{n}{3n+1}\right)^{\frac{n}{\beta}}$$

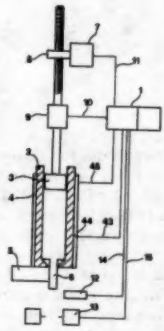
where C=consistency (%).

4,680,958

APPARATUS FOR FAST DETERMINATION OF THE RHEOLOGICAL PROPERTIES OF THERMOPLASTICS

Jean-Jacques Ruelle, Saint-Remy Geest; Giacomo d'Andrea, Brussels, and Léopold Asselberghs, Merchtem, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jul. 17, 1986, Ser. No. 886,439
Claims priority, application France, Jul. 18, 1985, 85 11146
Int. Cl.[4] G01N *11/08*
U.S. Cl. 73—56 12 Claims



1. Apparatus for the rapid determination of the rheological properties of a thermoplastic, comprising:

a control and monitoring unit (1)

a cylinder (2) intended to receive a determined measured quantity of the thermoplastic to be evaluated, and equipped with a thermostated jacketing (4) for the thermal conditioning, during at least 300 seconds and at a predetermined temperature, of the measured quantity of thermoplastic to be evaluated

a plunger (3) capable of sliding in the cylinder (2) so as to be applied to the measured quantity of thermoplastic

an exchanger system (5) enabling the cylinder to be equipped with a capillary die (6) suitable for the rheological measurement to be carried out a stepping-control motor (7) ensuring a monitored travel of the plunger (3) in the cylinder (2) to expel the thermoplastic through the capillary die (6), and

a force-sensor (9) arranged between the motor (7) and the plunger (3), yielding a signal as a function of the force applied to the plunger (3), characterized in that said apparatus additionally comprises an electronic microprocessor system monitoring the stepping-control motor (7) so that at the end of the thermal conditioning the plunger (3) is situated at a distance from the capillary die (6) which permits the measurement to be carried out and acts over a period of time ranging from 10 to 180 seconds on the measured quantity of thermoplastic to be evaluated in accordance with a parameter of speed of travel or of applied force specified by the type of rheological measurement to be carried out.

4,680,959

EMULATION SYSTEM FOR A MOTOR VEHICLE DRIVETRAIN

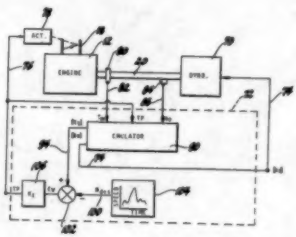
Kenneth J. Henry, Southfield, and Allan J. Kotwicki, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1986, Ser. No. 854,942
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117 3 Claims

1. In a motor vehicle engine testing arrangement including a motor vehicle engine and an electric dynamometer coupled to the output shaft of such engine and adapted to regulate the engine speed in accordance with a speed control signal applied thereto, a method of operating the dynamometer so as to emulate the combined effect of a motor vehicle and conventional motor vehicle drivetrain elements including a fluidic torque converter and a shiftable ratio automatic transmission, such method comprising the steps of:

defining first and second differential equations relating the ability of the drivetrain input torque to accelerate the engine inertia, and the ability of the drivetrain output torque to overcome the road load and accelerate the vehicle inertia;

modeling the combined operation of a fluidic torque converter and a shiftable ratio automatic transmission, and coupling the first and second differential equations therewith such that the drivetrain input torque is determined as



a function of measured engine output torque and the load that would be imposed on the engine by the torque converter and the drivetrain output torque is determined as a function of the transmission output torque and the road load of the vehicle;

periodically integrating the first and second differential equations forward in time assuming substantially constant engine output torque during the integration period to thereby predict the engine speed that would occur were the engine driving a motor vehicle through the defined drivetrain elements in opposition to the road load; and

generating a speed control signal for the dynamometer in accordance with the predicted engine speed to thereby load the engine as though it were actually installed in an motor vehicle with the modeled drivetrain elements.

4,680,960

MICROWAVE AND LUMINOUS PROBE

Teruo Yamanaka, 1756-2, Aza Hosoguchishita, Oaza Hirabari, Tempaku-cho, Tempaku-ku, Nagoya-shi, Aichi-ken; Takao Sugimoto, 4-148, Takabata, Nakagawa-ku, Nagoya-shi, Aichi-ken, and Kizo Hayakawa, 41-2, Higashiyashiki, Takayokosukamachi, Tokai-shi, Aichi-ken, all of Japan

Filed Aug. 14, 1985, Ser. No. 765,541
Claims priority, application Japan, Aug. 20, 1984, 59-173072
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 20 Claims

1. A microwave and luminous probe for detecting the piston position and the light emitted by combustion in a combustion chamber of an internal combustion engine, said microwave and luminous probe comprising:

(a) a probe body having an inner wall;

(b) a coaxial portion having first and second ends, said first end thereof inserted into said combustion chamber, said coaxial portion including a tubular outer conductor, an inner conductor disposed coaxially with said outer conductor, and a transparent insulator interposed between said out and inner conductors;

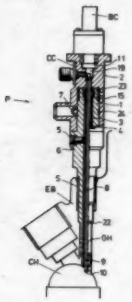
(c) dipole antenna means located at said first end of said coaxial portion;

(d) a see-through hole having a predetermined diameter, dimensioned so as to cut off microwave transmission, formed on said inner wall of said probe body and disposed

coaxially with said coaxial portion at said second end of said coaxial portion to lead the light emitted by combustion in said combustion chamber and received at said first end of said coaxial portion to a photosensor which detects said light;

(e) a coaxial impedance transformer provided between said see-through hole and connected to said coaxial portion at the second end of said coaxial portion for obtaining matching in impedance;

(f) a coaxial microwave connector fitted and inserted into a bore formed in said probe at a right angle to said see-



through hole and in communication with a side wall of said see-through hole;

(g) a bent coaxial portion provided within said see-through hole connected to both said coaxial microwave connector and to said impedance transformer;

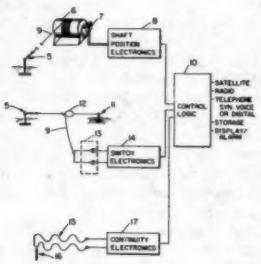
whereby the microwave propagated through said coaxial portion is transmitted from said dipole antenna means, while the microwave reflected from said combustion chamber is received by said dipole antenna means, and the light emitted by combustion in said combustion chamber is received by said transparent insulator.

4,680,961

SYSTEM AND METHOD FOR ICE MOVEMENT DETECTION IN DETERMINATION OF ICE BREAKUP

R. J. Grauman; G. W. Sponagle, and T. W. Rachuk, all of Wellsdale Research Limited, 6912 - 82 Avenue, Edmonton, Alberta T6B 0E7, Canada

Filed Jan. 27, 1986, Ser. No. 823,038
Int. Cl.[4] G01W *1/00*
U.S. Cl. 73—170 R **14 Claims**



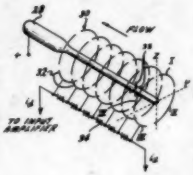
7. A system for detecting ice movement automatically in a frozen river or the like, comprising ice movement detection means connected with the ice at a selected location of potential ice movement as an indication of ice breakup, said detection means including means for causing a detectable electrical signal upon predetermined movement of the ice, means for detecting said electrical signal, and means for transmitting information concerning said electrical signal to a monitoring station.

4,680,962

FLUID FLOW RATE AND DIRECTION MEASURING APPARATUS

Enoch J. Durbin, 246 Western Way, Princeton, N.J. 08540

Filed Jan. 20, 1984, Ser. No. 572,433
Int. Cl.[4] G01F *1/56*
U.S. Cl. 73—189 **37 Claims**



1. Fluid flow meter apparatus for measuring the flow rate and direction of fluids passing therethrough, comprising:

(a) Fluid ionizing means having a first polarity when energized, in the path of fluid flow located on a first axis and including a substantially point source of ionizing potential;

(b) Ion collecting means having a second polarity, when energized, located in the path of fluid flow, radially displaced from said ionizing means, said ion collecting means including open structure conductive means having an axis parallel to said first axis to permit fluid to flow therethrough from any direction without essentially altering said fluid flow rate or direction, said ionizing means, when energized in the presence of a fluid, generating a plurality of ions from the fluid stream thereabout in a deflectable distribution, said plurality of ions migrating radially toward said ion collecting means and impinging thereon under a potential gradient created between said energizing ionizing means and said collecting means; and

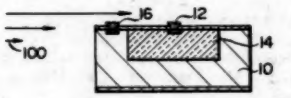
(c) Means responsive to the impingement of ions on said ion collecting means, for measuring the displacement of the area of impingement of ions effected by fluid flow, whereby the magnitude and direction of the displacement of the areas of impingement of said migrating ions in the presence of a fluid flow, relative to the areas of impingement of said migrating ions in the presence of a reference flow, is representative of the direction and rate of fluid flow relative to said first axis and axes mutually orthogonal thereto.

4,680,963

SEMICONDUCTOR FLOW VELOCITY SENSOR

Osamu Tabata; Hazime Inagaki, and Tomoyuki Kitano, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jan. 21, 1986, Ser. No. 820,703
Claims priority, application Japan, Jan. 24, 1985, 60-12064
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **11 Claims**



1. A semiconductor flow velocity sensor comprising:

a semiconductor substrate;

a thermal insulation means which is formed by selectively making a portion of said semiconductor substrate porous

and oxidizing said portion to form an oxidized porous silicon layer in such a manner that the surface of said thermal insulation means is exposed substantially flush with the surface of said semiconductor substrate;

an electrically energized heating unit formed of a part of the inner portion of said thermal insulation means, which has selectively been left when forming said thermal insulation means, in such a manner that the surface of said electrically energized heating unit is exposed substantially flush with the surface of said semiconductor substrate; and

peripheral sensor circuit means provided on said semiconductor substrate at the portion at which the heat transfer from said electrically energized heating unit is prevented by said thermal insulation means;

said surface of said semiconductor substrate which is provided with said electrically energized heating unit and said thermal insulation means being made substantially flat, thereby enabling stable detection of flow velocity over a long period of time without disturbing the flow of a fluid while being protected against contamination.

4,680,964

HEAT-WIRE TYPE AIRFLOW QUANTITY MEASURING APPARATUS

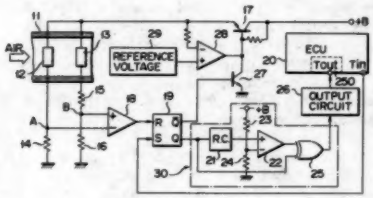
Yoshihisa Sato, Nagoya; Masumi Kinugawa, Okazaki; Susumu Akiyama, Kariya; Toshitaka Yamada, Nagoya; Tiaki Mizuno, Toyota; Atsushi Suzuki, Oobu, and Kengo Sugiura, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 16, 1986, Ser. No. 874,854

Claims priority, application Japan, Jun. 18, 1985, 60-130865; Sep. 4, 1985, 60-195324; Sep. 12, 1985, 60-202393

Int. Cl.[4] G01F *1/68;* **G01M** *19/00*

U.S. Cl. 73—204 **17 Claims**



1. A heat-wire type airflow quantity measuring apparatus, comprising:

heat generating means arranged in an airflow to be measured for producing heat in response to heating power applied thereto, the resistance of said heat generating means varying with changes in temperature;

first signal generating means for periodically generating pulse-shaped start signals;

heating power supplying means for supplying said heating power to said heat generating means in response to the start signals;

temperature detecting means for producing a detection signal when the temperature of said heat generating means attains a specified temperature;

heating power cut-off means for cutting off the heating power supplied to said heat generating means in response to said detection signal;

second signal generating means for generating a pulse-shaped time signal representative of the time of supply of heating power to said heat generating means and which rises in correspondence with the start signal and is cut off by said cut-off means;

third signal generating means for generating a pair of first and second pulses corresponding to the rise and fall of the pulse-shaped time signal; and

output means for generating an airflow quantity measurement signal representative of the interval between said pair of first and second pulses generated by said third signal generating means.

4,680,965

PROCESS FOR CONTINUOUS DENSITY MEASUREMENT

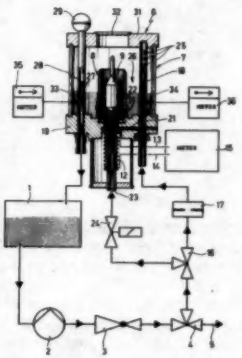
Heinz Weitmann, Rosenfeld, and Alfred Keller, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Weitmann & Konrad GmbH & Co. KG, Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,129

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443511

Int. Cl.[4] G01N *9/12*

U.S. Cl. 73—445 **3 Claims**



1. Apparatus for the continuous measurement of the density of a slowly flowing liquid, comprising an external vessel (**7**), a measuring vessel (**8**) inside the external vessel, the liquid to be measured flowing slowly through said measuring vessel and from there into said external vessel, an aerometer body (**9**) swimming in the liquid in said measuring vessel, a partition wall (**22**) between said measuring vessel and said aerometer body surrounding said aerometer body in an all around contactless manner, a first conduit (**21**) for supplying said slowly flowing liquid to be measured into said measuring vessel and to said aerometer body swimming therein, a second conduit (**23**) having a larger cross-section than the first conduit for also supplying liquid to be measured into said measuring vessel and to said aerometer body, said first and second conduits being connected to a common source (**1**) of said liquid to be measured, said second conduit including a valve (**24**) causing, when opened, a strong current of liquid to be measured to flow at a rapid rate via the second conduit into said measuring vessel and in the area between the aerometer body and the partition wall, said strong current when flowing past the aerometer body pulling off foreign matter adhering to the same.

4,680,966

APPARATUS FOR EXAMINING AN OBJECT BY ULTRASONIC ECHOGRAPHY

Jean-Marie Nicolas, Saint-Maur, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,222

Claims priority, application France, Jun. 15, 1984, 84 09411

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **10 Claims**

1. In apparatus for examining an object by ultrasonic echography which comprises:

a first ultrasonic transducer;

a second ultrasonic transducer;

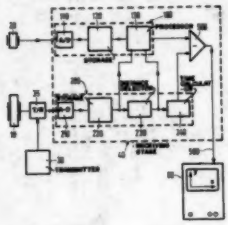
transmitter means connected to the first transducer which cause repeated transmission of ultrasonic waves into a region of the object to be examined;

receiver means which include first channel means connected to process echo signals which are reflected to the second transducer from the region; and

means connected for storing and/or visualizing information

supplied by the receiver means, the improvement wherein:

the first transducer also functions as a receiving transducer and the receiver means further comprise second channel means connected to receive output signals from the first transducer which functions to compute a theoretical traveling time for ultrasonic signals which propagate from the first transducer into the region and are reflected to the second transducer;



wherein the first channel means further comprises means which calculate the actual traveling time of signals which propagate from the first transducer to the second transducer; and further comprising

a first subtractor having inputs connected to receive the outputs of the first channel means and the second channel means respectively and having an output connected to the means for storing and/or visualizing information supplied by the receiver means.

4,680,967

ULTRASONIC ANGLE TEST PROBE HAVING AT LEAST TWO TRANSDUCERS

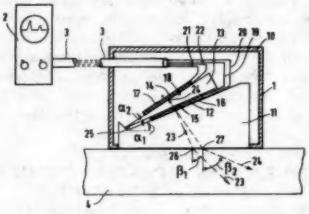
Manfred Rost, Wesseling, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Lewistown, Pa.

Filed May 12, 1986, Ser. No. 862,140

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534002

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—628 **2 Claims**



1. An ultrasonic angle test probe including at least two ultrasonic transducers for respectively generating and receiving ultrasonic waves propagating at different angles of propagation in a workpiece to which the probe is acoustically coupled, the first ultrasonic transducer being disposed on a first wedge-shaped coupling element, the improvement comprising:

the second ultrasonic transducer disposed on a second wedge-shaped coupling element, and

said second coupling element being disposed on said first coupling element,

whereby ultrasonic waves generated and received by said second transducer travel through said first transducer along their path to and from the workpiece to which said probe is coupled.

4,680,968

MECHANICAL VIBRATOR

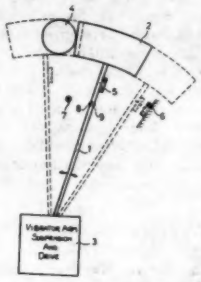
Dieter Sodeikat, Baierbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,478

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442811

Int. Cl.[4] G01H *9/00*

U.S. Cl. 73—651 **9 Claims**



1. In a mechanical vibrator for resonance operation with a beam chopper comprising:

a mechanically stiff vibrator arm representing a fixed mass, a spring having a fixed spring constant attached to and acting upon said vibrator arm wherein the vibrator arm and the spring comprise a mass/spring system having a resonance frequency,

drive means for vibrating said vibrator arm with an amplitude waveform having a first half-wave and second half-wave, said drive means including positive feedback circuit control means for self excitation at the resonance frequency of the mass/spring system, and

measuring device means for determining the velocity or the position of the vibrator arm,

the improvement comprising:

means for influencing the ratio of the time of the first and second half waves and/or the vibration frequency of the vibrator arm, said means comprising at least one first magnetic system located on the vibrator arm and at least one second magnetic system located off the vibrator arm which is in operational connection with the first magnetic system.

4,680,969

ULTRASONIC PROBE JIG

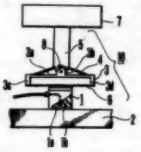
Yasuo Hama, and Shigetake Takaku, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 892,338

Claims priority, application Japan, Sep. 6, 1985, 60-195812

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—661 **8 Claims**



1. An ultrasonic probe jig comprising:

a leaf spring member brought into contact with an upper surface of an ultrasonic probe to be located on an object to be examined;

a support member for supporting a peripheral portion of said leaf spring member;

a mounting mechanism for pivotally mounting a support rod coupled to a control device on said support member; and

a regulating member one end of which is mounted to said support rod and the other end of which is engaged with said support member, said regulating member being adapted to regulate pivotal movement of said support member.

4,680,970

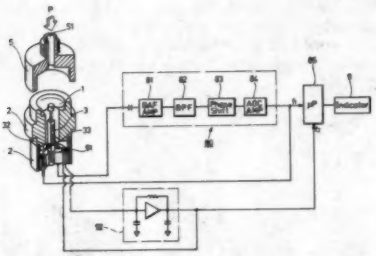
APPARATUS FOR MEASURING PRESSURE

Toshitsugu Ueda; Fusao Kohsaka; Daisuke Yamazaki, and Hideo Akazawa, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jan. 31, 1986, Ser. No. 825,082

Int. Cl.[4] G01L *11/00*

U.S. Cl. 73—702 **7 Claims**



1. A pressure measuring apparatus comprising a diaphragm to which pressure to be measured is applied; and a resilient vibrator linked to said diaphragm and driven by a force produced by said diaphragm in response to said pressure, wherein said diaphragm comprises a peripheral circumferential portion, a central fixing portion, and a non-planar intermediate portion therebetween, with said fixing portion having an edge part secured to said vibrator at a non-perpendicular angle, wherein said peripheral portion and said fixing portion comprise rising edge portions of predetermined dimensions, said rising edge portions being attached parallel to said vibrator.

4,680,971

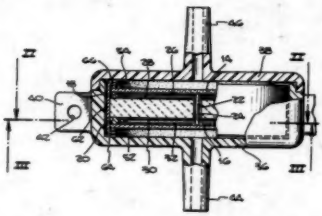
DUAL DIAPHRAGM DIFFERENTIAL PRESSURE TRANSDUCER

Fred Kavli, Malibu, and Kyong Park, Chatsworth, both of Calif., assignors to Kavlico Corporation, Moorpark, Calif.

Filed Nov. 19, 1985, Ser. No. 799,447

Int. Cl.[4] G01L *7/08, 9/12, 13/02;* **H01G** *7/00*

U.S. Cl. 73—718 **25 Claims**



1. A corrosion proof pressure transducer assembly for measuring the pressure difference between two fluids, comprising:

a central circular insulating base member having a central opening and two spaced flat sides;

first and second thin circular, flat insulating diaphragms having substantially zero mechanical hysteresis, and each having a diameter substantially equal to that of said base member;

means for mounting said diaphragms, one on each side of said base member and spaced apart from said base member by between 0.0005 and 0.010 inch;

a coupling member having substantially the same coefficient of thermal expansion as said insulating base member, mechanically interconnecting the centers of said pair of diaphragms and extending through the central opening in said base member;

facing conductive means in the form of conductive surfaces on the inner surface of one of at least one of said ceramic diaphragms and the adjacent surface of said base member, for forming a variable capacitor having a capacitance which varies as the diaphragms flex;

housing means having first and second input ports for applying fluid pressures from two different sources directly to the outer surfaces of said first and second diaphragms, respectively; and

resilient means mounted near the peripheries of said first and second diaphragms directing and limiting the fluid path from each of said input ports to the associated diaphragm;

whereby the capacitance between said two conductive surfaces is a function of the difference in the fluid pressures applied to said two diaphragms, and said conductive surfaces are isolated from any possible corrosion from the fluids being measured.

4,680,972

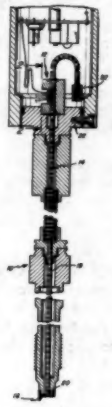
PRESSURE TRANSDUCER

William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Filed Jan. 7, 1985, Ser. No. 689,385

Int. Cl.[4] G01L *7/04, 9/04*

U.S. Cl. 73—730 **35 Claims**



1. A pressure transducer comprising;

an elongated frame having an elongated passage therethrough,

a capillary tube extending through the frame passage and terminating at one end adjacent one end of the frame,

a coupler at said one end of the frame and defining with the frame a chamber in communication with the capillary tube,

a sensing member disposed about the capillary tube at the other end of the frame and including means defining an annular sensing chamber in fluid communication with the capillary tube, and means defining a recess in the sensing member forming a relatively thin wall adjacent said annular sensing chamber,

and means for sensing pressure at said wall,

said capillary tube having a passage therethrough extending substantially transverse to the axis thereof and for permitting fluid communication between the capillary tube and said annular sensing chamber.

4,680,973

ELECTROMAGNETIC FLOW METER CONVERTER

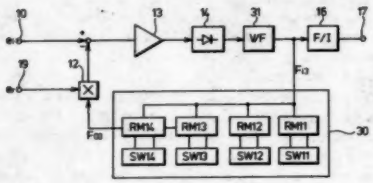
Tamotsu Kobayashi; Shigeru Goto; Hironobu Ohta, and Takashi Torimaru, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,958

Claims priority, application Japan, Oct. 25, 1984, 59-224875; Nov. 30, 1984, 59-182043[U]

Int. Cl.[4] G01F *1/60*

U.S. Cl. 73—861.16 8 Claims



1. An electromagnetic flow meter converter comprising

a deviation amplifier for taking from a flow rate detector an input signal representing flow rate and a feedback signal and then amplifying a deviation between said feedback signal and said input signal and for providing an amplified output;

a converter circuit for converting said amplified output of said deviation amplifier into a frequency signal;

a first frequency divider for frequency dividing said frequency signal and for providing a frequency divided output;

a digital setting unit for setting a frequency dividing factor for said first frequency divider; and

a first multiplying means for multiplying said frequency divided output of said first frequency divider by a comparison voltage which is proportional to current applied to a coil in said flow rate detector, to provide said feedback signal; wherein

the product of a meter constant of said flow rate detector and a predetermined maximum velocity of flow is set in said digital setting unit.

4,680,974

MASS FLOW METER ON THE CORIOLIS PRINCIPLE

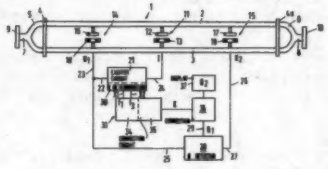
Jens K. Simonsen, and Hans J. Moos, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 5, 1986, Ser. No. 826,315

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505166

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 13 Claims



1. A mass flow meter operable on the Coriolis principle, comprising, two rectilinear juxtaposed parallel arranged tubes mechanically interconnected at their ends, wye tube fittings connecting adjacent ends of said tubes to provide for connections to supply and discharge pipes and for parallel flow through said tubes, oscillator means between said tubes for producing opposite oscillatory movement of said tubes with a harmonic oscillation superimposed on the fundamental oscillation, first and second sensor means between and at opposite ends of said tubes and spaced from said oscillator means for sensing relative movement between said tubes and generating first and second signals corresponding thereto, means responsive to said first and second signals for generating a first value of mass flow, frequency determining circuit means responsive to said first signal for determining the resonant frequencies of said fundamental and harmonic oscillations and for deriving therefrom a correcting value which (gives effect to) is a measure of axial stresses in said measuring tubes and means for applying said correcting value to said first value to determine a corrected mass flow.

4,680,975

TEST STAND FOR POWER PLANTS AND METHOD

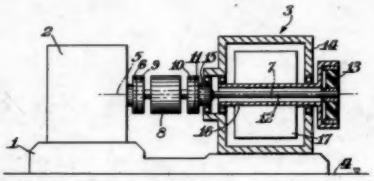
Hans-Walter Dodt, Muehltal, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 835,047

Claims priority, application European Pat. Off., Mar. 1, 1985, 85102310

Int. Cl.[4] G01L *3/16*

U.S. Cl. 73—862.09 9 Claims



1. A method of operating a test stand for power plants wherein the power plant under test is connected to a power absorbing unit at one end thereof by a coupling flange and wherein the allowable measuring speed of the power absorbing unit depends on the permissible additional weight on the coupling flange, the method including the step of locating excess weight above the permissible additional weight at the other end of the power absorbing unit and introducing torque from the power plant under test to such other end of the power absorbing unit dampened form.

4,680,976

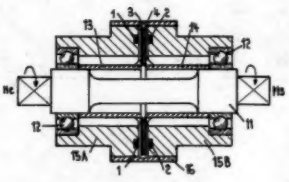
TORQUE OR ANGLE OF TORSION MEASURING DEVICE

Martin Lustenberger, Fribourg, Switzerland, assignor to Vibro-Meter SA, Fribourg, Switzerland

Filed Nov. 15, 1985, Ser. No. 798,674

Int. Cl.[4] G01B *7/14*

U.S. Cl. 73—862.33 9 Claims



1. A torque or angle of torsion measuring device comprising:

a shaft for receiving and transmitting a torque to be measured;

at least one pair of disk-shaped shielding elements facing each other, arranged concentrically to said shaft and connected respectively to opposite extremities of said

shaft, each of said shielding elements comprising a plurality of electrically conductive zones separated by identical electrically nonconductive zones, the number of said zones being the same on both shielding elements, said zones extending between an outer and an inner diameter of said shielding elements which are mutually angularly shifted in response to said torque for providing a variable electromagnetic shielding; and

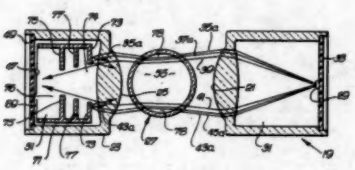
at least two coils of same middle diameter arranged concentrically to said shaft and located at either side of said pair of shielding elements, at close proximity thereto, one of said coils being an electromagnetic signal transmitting coil and the other coil a receiving coil for said signal, said receiving coil delivering an output signal having an amplitude depending on said mutual angular shift of said shielding elements.

4,680,977

OPTICAL FLOW SENSOR

Ronald S. Conero, and Terry L. Landis, both of San Diego, Calif., assignors to Ivac Corporation, San Diego, Calif.

Filed Mar. 6, 1985, Ser. No. 708,969
Int. Cl.[4] G01F 13/00; A61M 5/14
U.S. Cl. 73—861.41 21 Claims



1. A fluid flow sensor comprising:

a supporting base having a first arm and a second arm generally parallel to the first arm and separated therefrom to define a space;

a drip chamber assembly having transparent walls defining a drip chamber, said walls having a refractive effect upon energy entering and exiting the chamber therethrough;

means, located within the drip chamber, for forming said fluid into drops, operative to cause said drops to fall through the chamber;

retaining means for retaining said drip chamber assembly in a predefined position within the space;

an energy emitter mounted on the first arm;

first energy refracting means, mounted in fixed relationship to the energy emitter, oriented to receive energy emitted by said emitter and operative to refract said energy toward said drip chamber assembly in a pattern that has been predetermined with reference to the refractive effects of the walls of said drip chamber assembly to cause said energy to pass through substantially the entire width of said drip chamber;

an energy detector mounted on the second arm; and

second energy refracting means, mounted in fixed relationship to the energy detector, oriented to receive said pattern of energy that has been refracted by the first refracting means and further refracted upon passing through the walls of said drip chamber assembly, and operative to still further refract said energy onto the energy detector;

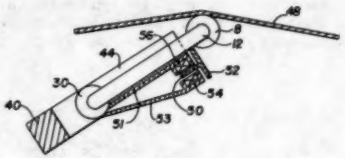
at least one of said energy refracting means comprising a hollow block of transparent material having a refracting lens formed in a lens side thereof and oriented with said lens generally facing the predefined position.

4,680,978

ROLLING MILL STRIP TENSION MONITORING AND SHAPEMETER ASSEMBLY

Vladimir B. Ginzburg, and G. Brian Jones, both of Pittsburgh, Pa., assignors to Wean United Rolling Mills, Inc. and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 778,319
Int. Cl.[4] G01L 5/04; B21C 51/00
U.S. Cl. 73—862.07 14 Claims



1. A rolling mill strip tension monitoring assembly comprising

roll supporting means,

a plurality of generally axially aligned strip contacting rolls rotatably secured to said roll supporting means,

noncontacting sensor supporting means,

sensor means fixedly secured to said sensor supporting means,

said roll supporting means being relatively movable with respect to said sensor supporting means, whereby movement of said rolls other than axial rotational movement thereof will alter the relative position of said sensor means with respect to said roll supporting means,

said roll supporting means being rotatably secured to said sensor supporting means,

said sensor means having transducer means,

said transducer means being of the inductive type, whereby movement of said rolls other than axial rotation movement will effect a responsive change in the transducer means output signal which permits monitoring of strip tension,

said transducer means having at least one linear array of transducers,

said roll supporting means having a shift rotatably secured to said sensor supporting means and a plurality of spaced roll supporting beams projecting from said shaft, and

each of said rolls being rotatably secured to a pair of said beams.

4,680,979

PLANETARY GEAR STARTER

Akira Morishita; Yoshifumi Akae; Kyoichi Okamoto; Taiichi Nakagawa; Hiroyuki Morikane, all of Himeji; Tadami Kounou, Kanzaki; Takemi Arima, and Akinori Hasegawa, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,097
Claims priority, application Japan, Dec. 20, 1984, 59-194581[U]; Dec. 20, 1984, 59-194582[U]
Int. Cl.[4] F02N 15/06
U.S. Cl. 74—7 E 7 Claims

1. A planetary gear starter comprising:

a direct current motor;

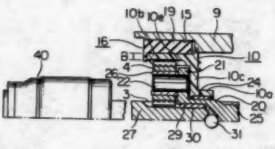
a first output shaft connected to the rotor of said motor so as to be driven thereby;

a planetary type reduction gear comprising a sun gear secured to said first output shaft so as to rotate therewith, a planet gear which meshes with said sun gear, and an internally-toothed ring gear which is concentrically disposed with respect to said sun gear and which internally meshes with said planet gear, said ring gear having a first cylindrical portion of a predetermined longitudinal length

an open end and a plurality of longitudinally-extending ribs formed on an outer surface of said first cylindrical portion, said ribs extending for a distance less than the longitudinal length of said first cylindrical portion of said ring gear so as to provide an unribbed portion about said open end;

a second ouput shaft rotatably connected to said planet gear said second output shaft is rotated by the planetary movement of said planet gear about said sun gear;

a hollow frame having a cylindrical inner surface which receives said ring gear, said frame having a plurality of longitudinally-extending inward projections formed on the inner surface of said frame, said inward projections being disposed about the inner surface so that each of said



inward projections engages a corresponding one of said ribs, a plurality of longitudinally extending cavities formed between the outer surface of the first cylindrical portion of said ring gear and the inner surface of said frame and respectively between the plurality of engaging ribs and inward projections;

an annular elastic reinforcing member secured in a press fit over the first cylindrical portion of said ring gear in said unribbed portion; and

a plurality of longitudinally-extending elastic shock absorbing members respectively received in said cavities, each of said shock absorbing members having a shape and size which is substantially equal to and associated with one of said cavities formed between said frame and said ring gear.

4,680,980

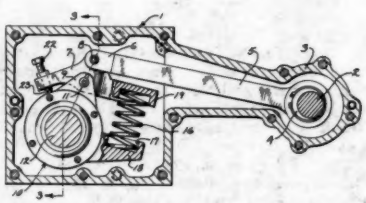
DRIVE MECHANISM

George E. Olson, Arlington Heights, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Oct. 3, 1985, Ser. No. 783,774

Int. Cl.[4] F16H *29/00*

U.S. Cl. 74—125 **10 Claims**



1. A drive mechanism, comprising a supporting structure, an oscillating member mounted to move in an oscillating path of travel relative to said supporting structure, drive means to impart oscillatory movement to said oscillating member, a rotatable output member, first overrunning clutch means associated with the output member, said first clutch means being constructed and arranged so that rotation of said first clutch means in a first direction causes said first clutch means to engage the output member to thereby rotate said output member in said first direction, said first clutch means being freely rotatable relative to said output member in a second direction, and means interconnecting the oscillating member and said clutch means for transmitting oscillatory motion to said clutch means to alternately move said clutch means in said first and second directions, resilient means interconnecting said oscilalting member and said first clutch means, said resilient means constructed and arranged to be compressed by oscillatory movement of said oscillating member in said first direction during conditions when said output member encounters a predetermined excessive load to thereby provide overload protection for said mechanism, one end of said resilient means being engaged with said first clutch means, and said mechanism includes a seat on said oscillating member, the opposite end of said resilient means being engaged with said seat, and means for mounting said seat for pivotal movement relative to said oscillating member.

4,680,981

RACK AND PINION GEAR AND A METHOD OF ASSEMBLING SUCH A GEAR

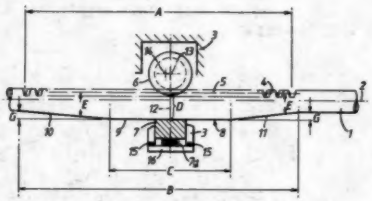
Philip A. Downing, Bristol, United Kingdom, assignor to TRW Cam Gears Limited, Hertfordshire, Great Britain

Filed Feb. 22, 1985, Ser. No. 704,420

Claims priority, application United Kingdom, Feb. 27, 1984, 8405076

Int. Cl.[4] B62D *3/12*

U.S. Cl. 74—422 **5 Claims**



1. A rack and pinion gear assembly comprising:

a housing;

a rack bar having rack gear teeth and a longitudinally extending axis and being longitudinally displaceable in said housing;

a pinion having gear teeth and rotatably mounted in said housing and having its gear teeth in engagement with the gear teeth of said rack bar so that rotation of said pinion effects longitudinal displacement of said rack bar;

support means located between said rack bar and said housing on the side of said rack bar remote from said pinion, said rack bar having a bearing surface on said remote side of said rack bar, said support means engaging said bearing surface and resiliently biasing said rack bar to urge the gear teeth thereof into engagement with the gear teeth of said pinion, and said support means including means for adjusting the biasing force applied to said rack bar;

said gear teeth of said rack bar forming a longitudinally extending array of coplanar teeth thereon, the operative length of said array of coplanar teeth corresponding to at least three revolutions of said pinion, said bearing surface being substantially co-extensive longitudinally with said operative length and comprising a central bearing region which is substantially parallel to the longitudinally extending axis of said rack bar and two end bearing regions extending longitudinally from opposite ends of said central bearing region;

said central bearing region extending longitudinally for a distance which corresponds at least to the displacement of said rack bar caused by one revolution of said pinion and which is not greater than the displacement of said rack bar caused by one and a half revolutions of said pinion, said central bearing region extending longitudinally substantially symmetrically relative to a line perpendicular to the longitudinal axis of said rack bar and which passes

through the mid-length position of said operative length; and

the distance between said longitudinally extending axis of said rack bar and said bearing surface in a direction transverse to said longitudinally extending axis being greater in the central bearing region than in the end bearing regions.

4,680,982

CIRCULATING-BALL DRIVE

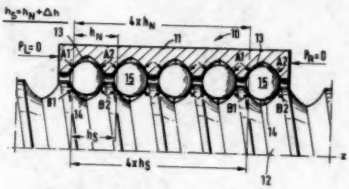
Richard Wilke, Am Weissenfeld 4, D-5830 Schwelm, and Helmüt Korthaus, Fernblick 3, D-5600 Wuppertal 2, both of Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,228

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209086

Int. Cl.⁴ F16H *1/18, 1/20*

U.S. Cl. 74—424.8 R **4 Claims**



1. A circulating-ball drive comprising a spindle, a unitary one-piece nut coaxially surrounding said spindle along part of the length thereof, and a set of identical bearing balls interposed between said spindle and said nut, said spindle having a single outer helical groove of uniform cross-section with a multiplicity of turns, said nut having a single inner helical groove of uniform cross-section with a plurality of turns confronting respective turns of said outer groove and forming part of at least one closed track for the recirculation of bearing balls confined between the confronting turns, each of said turns having a profile with two symmetrical flanks engaging the confined bearing balls along a helical contact line whereby each confined ball is exclusively in two-point continuous contact with each of said spindle and said nut over the full length of a path for each ball in contact with both said spindle and said nut, the turns of said outer groove having a constant pitch over the length thereof exceeding by a small fraction the pitch of the turns of said inner groove which is constant over the length thereof in an unstressed state of said nut over the full length of said nut, with resulting uniform elastic axial deformation of said nut upon assembly so that under all operating conditions said grooves engage each ball with four-point contact exclusively during the travel of each ball over the length of said spindle.

4,680,983

TRANSMISSION DIRECTION SELECTION SYSTEM

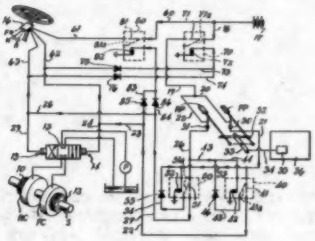
David J. Brown, Stockport, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 10, 1985, Ser. No. 807,137

Int. Cl.⁴ B60K *20/00, 20/10*

U.S. Cl. 74—474 **8 Claims**

1. A drive direction selection system for a vehicle transmission, the selection system comprising a source of electrical power, a first circuit for supplying an electrical signal from the source to a forward drive direction engagement means, a second circuit for supplying an electrical signal from the source to a reverse drive direction engagement means, forward and reverse direction selector switches in the first and second circuits respectively controlled by forward and reverse direction selection pedals respectively, said drive direction selector switches both being movable between an open condition and a closed condition by moving the associated pedal between a raised and a depressed position respectively, first interlock means arranged to break the first circuit on depressing the reverse selection pedal to close reverse selector switch and to maintain the first circuit broken until both switches are again



simultaneously in their open condition, and second interlock means arranged to break the second circuit on depressing the forward selection pedal to close the forward selector switch and to maintain the second circuit broken until both switches are again simultaneously in their open condition.

4,680,984

TORSIONAL VIBRATION DAMPER

Werner Wähling, Kraiburg/Inn, and Günther Ziegler, Waldkraiburg, both of Fed. Rep. of Germany, assignors to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG, Waldkraiburg, Fed. Rep. of Germany

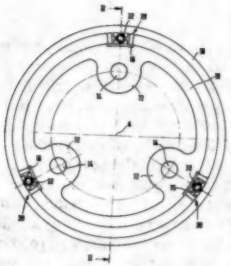
PCT No. PCT/EP85/00238, § 371 Date Jan. 6, 1986, § 102(e) Date Jan. 6, 1986, PCT Pub. No. WO85/05663, PCT Pub. Date Dec. 19, 1985

PCT Filed May 20, 1985, Ser. No. 823,483

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420570

Int. Cl.⁴ F16F *15/12*

U.S. Cl. 74—574 **7 Claims**



1. A torsional vibrator damper comprising:

a support which includes fastening means for mounting said support to a shaft flange or the like,

a flywheel postitioned coaxially around said support and radially spaced therefrom, and

a plurality of elastomeric spring elements disposed between said support and said flywheel and circumferentially spaced apart from each other, each of said spring elements being connected to an outer surface of said support and an inner surface of said flywheel, each of said spring elements including a cavity therein formed of a pair of opposed, rolling curves of elastomeric material and having a rigid rolling body within said cavity and in contact with said rolling curves and supported therein under radial bias, with said rolling curves converging in a circumferential

direction at both sides of an associated rolling body and being formed by a layer of the elastomeric material which becomes progressively thicker in circumferential direction toward both sides of said rolling element, with said rolling curves terminating at each end in a T-shaped slot.

4,680,985

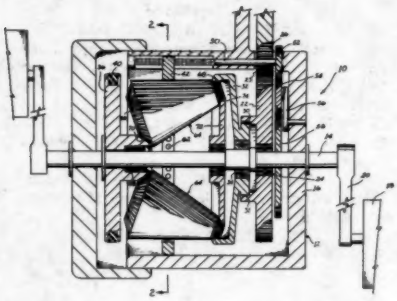
CONTINUOUSLY VARIABLE TRANSMISSION WITH EPICYCLIC CONSTANT MESH GEARING

Thomas F. Troester, 16561 Barryknoll Way, Granger, Ind. 46530

Continuation-in-part of Ser. No. 652,497, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 367,299, Apr. 12, 1982, abandoned. This application Oct. 23, 1985, Ser. No. 790,427

Int. Cl.[4] F16H *3/50*

U.S. Cl. 74—785 **2 Claims**



1. A continuously variable transmission comprising a housing, an input shaft, said input shaft journaled in said housing, a nonrotatable ring gear mounted in said housing, means for shifting said ring gear axially relative to said input shaft, an output gear, a gear cone having an outer conical surface including teeth meshing with said ring gear and a base, said cone including teeth adjacent to the base of said conical surface in mesh with said output gear, and means for connecting said cone to said input shaft whereby rotation of the input shaft is converted into rotation of said output gear and said ring gear is shiftable axially to vary the ratio of rotation of said input shaft and said output gear, said means connecting said cone to said input shaft including a first input gear rotatably mounted on the input shaft and in mesh with one end of the cone, idler means rotatably mounted on said input shaft for supporting said cone one end in meshing contact with said first input gear whereby rotation of said input shaft causes rotation of said cone, said means connecting said cone to said input shaft including means for providing an alternate power source of rotation of said cone, said alternate rotative source means including a second input gear mounted on said input shaft and adapted to rotate in response to said alternative power source, reduction gear means for connecting said first and second input gears, clutch means mounting said first input gear on said input shaft for making the first input gear nonresponsive to rotation of the input shaft when said second input gear causes the first input gear to rotate at a higher speed of rotation than the input shaft.

4,680,986

DRIVE UNIT, PARTICULARLY FOR SHORT-HAUL VEHICLES

Ernst Elsner, Herbrechtingen, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany

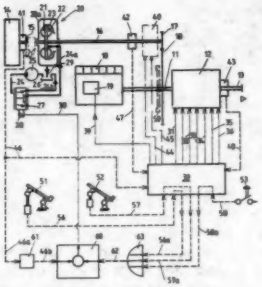
PCT No. PCT/EP85/00148, § 371 Date Dec. 31, 1985, § 102(e) Date Dec. 31, 1985, PCT Pub. No. WO85/05600, PCT Pub. Date Dec. 19, 1985

PCT Filed Apr. 2, 1985, Ser. No. 822,413

Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3419958

Int. Cl.[4] B60K *41/28, 9/04*

U.S. Cl. 74—866 **22 Claims**



1. A drive unit for a vehicle, comprising:

an input shaft intended to be driven by an engine, an output shaft and a transmission disposed between the input shaft and the output shaft and effective for setting a transmission ratio therebetween, the input shaft coupling the engine and the transmission to one another and the output shaft being effective for applying rotational energy from the transmission to the vehicle;

a flywheel accumulator;

a slippable coupling for coupling the input shaft and the flywheel accumulator to one another, the slippable coupling comprising a first coupling half and a second coupling half and having a speed ratio which is infinitely adjustable within a speed ratio range extending between a lower and an upper limit;

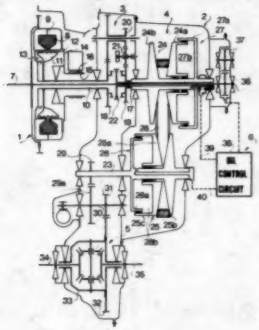
the drive unit being of the type which permits rotational energy to flow from the flywheel accumulator to the output shaft when the vehicle is in an acceleration mode and from the output shaft to the flywheel accumulator when the vehicle is in a braking mode; and

a control device for controlling the transmission such that whenever the slippable coupling approaches one of its speed ratio limits, the transmission ratio is adjusted such that the speed ratio of the coupling remains within its speed ratio range; the control device further comprising means for controlling the transmission such that the speed of rotation of that coupling half of the first and second coupling halves which is situated first in the direction of energy flow rotates at a greater speed than the other of the two coupling halves which is located downstream along the energy flow direction.

4,680,987
CONTROL SYSTEM FOR AN INFINITELY VARIABLE TRANSMISSION

Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,475
Claims priority, application Japan, Nov. 16, 1984, 59-241957
Int. Cl.[4] B60K 41/16
U.S. Cl. 74—866 10 Claims



1. In a system for controlling an infinitely variable transmission for transmitting the power of an internal combustion engine through a clutch for driving a motor vehicle, the transmission comprising a drive pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the system including a pressure oil circuit having a pump for supplying pressurized oil, and a transmission ratio control valve having a spool for controlling the pressurized oil so as to move the disc of the drive pulley to change the actual transmission ratio of the transmission, the improvement in the system comprising:

first means for moving the spool of the transmission ratio control valve;

second means responsive to disengagement of the clutch, when speed of the vehicle is below a predetermined speed, for producing a coasting signal;

third means responsive to the coasting signal for producing a drive pulley speed set signal;

fourth means responsive to the drive pulley speed set signal for producing a shifting signal representing a quantity of shifting the spool of the transmission ratio control valve in upshifting direction, and

fifth means responsive to the shifting signal for shifting the spool of the transmission ratio control valve in the upshifting direction via said first means thereby decreasing the drive pulley speed.

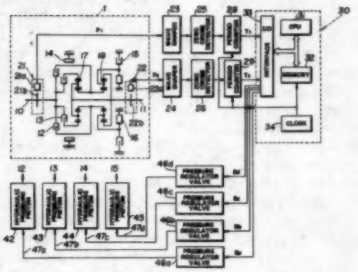
4,680,988
CONTROL FOR SHOCK-FREE SHIFT IN AN AUTOMATIC TRANSMISSION

Yasushi Mori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 21, 1985, Ser. No. 800,394
Claims priority, application Japan, Nov. 22, 1984, 59-245879; Dec. 5, 1984, 59-255813; Dec. 5, 1984, 59-255814
Int. Cl.[4] B60K 41/18
U.S. Cl. 74—866 14 Claims

1. A device for controlling a motor vehicle installed with an engine and an automatic transmission during a shift in gear position in the automatic transmission, the automatic transmission having an input shaft drivingly connected to the engine and an output shaft, comprising:

means for detecting an actual value in a speed ratio of a revolution speed of the input shaft to that of the output shaft during a transient period involving a shift in gear position in the automatic transmission and generating an actual speed ratio indicative signal indicative of said actual value in said speed ratio; and

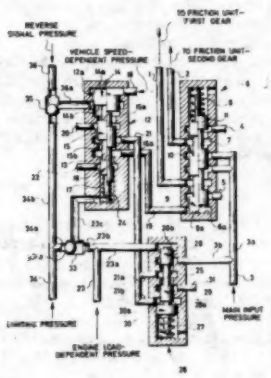


means for effecting a closed loop control of said shift in gear position based on said actual speed ratio indicative signal during the transient period.

4,680,989
HYDRAULIC SHIFT CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION HAVING TWO GEAR RATIOS

Jan Sykora, and Jan Wangler, both of Prague, Czechoslovakia, assignors to PRAGA-Zavody Klementa Gottwalda, narodni podnik, Prague, Czechoslovakia

Filed Dec. 30, 1985, Ser. No. 814,642
Claims priority, application Czechoslovakia, Dec. 28, 1984, 10512-84; Nov. 5, 1985, 7939-85
Int. Cl.[4] B60K 41/06
U.S. Cl. 74—867 2 Claims



1. In a hydraulic shift control device for an automatic vehicle transmission having two gear ratios shiftable between each other by selectively actuating fluid operated first and second friction engaging means according to the vehicle speed, engine load condition and operator's commands, the hydraulic shift control device comprising:

a shift valve having a spool shiftable between initial first and alternate second position, said spool in initial first position connecting a main input pressure with the second friction engaging means while discharging actuating pressure from the first friction engaging means and in alternate

second position connecting the main input pressure circuit with the first friction engaging means, while discharging actuating pressure from the second friction engaging means, said shift spool shiftable from the initial first position to the alternate second position by action of a modulated pressure, the modulated pressure being of inverse proportion to an einge load-dependent pressure, said modulated pressure supplied to the shift valve from a single valve in a modulated pressure line,

a modulator valve modulating the main input pressure to produce the modulated pressure, the main input pressure being modulated by the action of the engine load-dependent pressure introduced to the modulator valve from an engine load-dependent pressure circuit, the modulator valve being connected by a modulator pressure conduit with the signal valve,

the signal valve, having a spool provided with three circumferential lands of different diameters, the first one an outer land of largest diameter, the seond one an inner land of middle diameter and the third one an outer land of smallest diameter, said spool shitable between an initial first position and an alternate second position by a vehicle speed-dependent pressure acting on the terminal work face of the first land, said spool being urged back into the initial first position by a spring and by the engine load-dependent pressure or by a spring and an operator-actuated limiting pressure, acting on the terminal work face of the third land, said signal valve spool, in the initial first position allowing a modulated pressure to pass from the modulator valve to the shift valve through the groove created between the second land and the third land while preventing drainage of the modulated pressure line connecting said signal valve and said shift valve, and in the second, alternate position draining the modulated pressure line connecting said signal valve and said shift valve while blocking input of the modulated pressure to a signal valve from the modulator valve, a limiting pressure circuit actuable by a vehicle operator, and

a pilot shuttle valve including

(1) a first inlet of the engine load-dependent pressure from an engine load-dependent pressure circuit,

(2) a second inlet of limiting pressure from the limiting pressure circuit actuable by the vehicle operator,

(3) an output to the signal valve;

said pilot shuttle valve allowing to the higher of two said engine load-dependent pressure and limiting pressure, respectively, to pass to the signal valve while preventing the lower of said pressures, the engine load-dependent pressure and limiting pressure respectively, to pass through the pilot shuttle valve.

4,680,990

SYSTEM FOR CONTROLLING THE TRANSMISSION RATIO OF AN INFINITELY VARIABLE TRANSMISSION

Masaaki Ohgami, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Van Doorne's Transmissie B. V., Tilburg, Netherlands

Filed Apr. 12, 1985, Ser. No. 722,961

Claims priority, application Japan, Apr. 19, 1984, 59-79746

Int. Cl.[4] B60K *41/16*

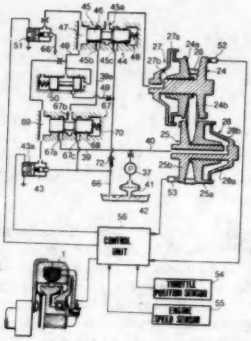
U.S. Cl. 74—868 **3 Claims**

1. In a system for controlling the transmission ratio of an infinitely variable transmission for an engine mounted on a vehicle, the engine having a throttle valve and an electromagnetic clutch having a coil for transmitting the power of the engine to the transmission, said transmission comprising a primary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a secondary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the secondary pulley, and a belt engaged with both pulleys, the improvement comprising;

a hydraulic circuit having a transmission ratio control valve having an end chamber and a spool moved by control oil supplied to the end chamber for selectively shifting the disc of the primary pulley in the downshift direction and upshift direction, respectively, first passages including a supply passage for supplying oil to the hydraulic cylinder of the primary pulley passing through the transmission ratio control valve and a first drain passage for draining the oil in the hydraulic cylinder of the primary pulley passing through the transmission ratio control valve, a control oil passage for supplying a part of drain oil in the first drain passage as the control oil to the end chamber, and a second drain passage for draining the oil in the end chamber;

said hydraulic circuit including

means comprising a regulator valve provided in the control oil passage for keeping the pressure of the control oil in the control oil passage constant;



first means for detecting conditions of transient acceleration of the vehicle for producing a first signal;

second means responsive to said first signal for producing a control signal representing variation rate of the transient;

said hydraulic circuit including third means including a solenoid operated valve provided in the second drain passage and a solenoid responsive to the control signal for operating the solenoid operated valve to control the amount of oil in the end chamber for shifting said spool of said transmission ratio control valve in the downshift direction, and

clutch control means responsive to the control signal for decreasing clutch current passing through the coil of the electromagnetic clutch so as to increase speed of the engine for a period.

4,680,991

SYSTEM FOR CONTROLLING THE TRANSMISSION RATIO IN AN INFINITELY VARIABLE TRANSMISSION

Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,706

Claims priority, application Japan, Jan. 30, 1984, 59-14741

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—868 **8 Claims**

1. In a control system for an infinitely variable transmission for a vehicle powered by an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the transmission defining a transmission ratio, a hydraulic circuit having a pump for supplying oil, a detecting means for producing a first signal dependent on engine speed, a transmission ratio control valve having a shiftable first spool responsive to the first signal for controlling the oil and for shifting the disc of the drive pulley

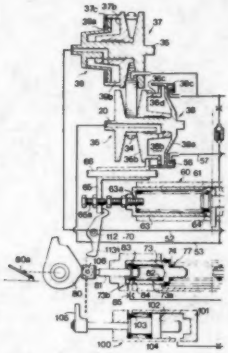
to change the transmission ratio, and a pressure regulator valve having a second spool responsive to the transmission ratio for increasing line pressure of the hydraulic circuit with an increase of the transmission ratio, wherein the improvement comprises:

a plunger coaxial with the spool of the transmission ratio control valve and axially movable provided;

a spring provided between the first spool and the plunger;

first means for shifting the plunger in dependency on depression of an accelerator pedal of the vehicle, thereby via said spring shifting the first spool in opposition to the force dependent on the first signal;

said manual selecting means for applying the line pressure to the actuator for releasing the actuator from the plunger;



an actuator for shifting the plunger against the force dependent on the first signal;

manual selecting means for operating the actuator for shifting the plunger against the force dependent on the first signal;

second means responsive to the movement of the disc of the drive pulley from a predetermined transmission ratio in a transmission ratio increasing direction for disabling the actuator; and

said manual selecting means for operating the actuator, whereby when the actuator operates, the first spool is shifted at a predetermined engine speed, so that the transmission ratio begins to increase and the load on the spring is reduced after the predetermined transmission ratio by the operation of the second means.

4,680,992

DOWNSHIFT TIMING AND ENGINE BRAKE CONTROL FOR AUTOMATIC TRANSMISSION

Koichi Hayasaki, Fujisawa, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 5, 1986, Ser. No. 893,243

Claims priority, application Japan, Aug. 5, 1985, 60-171154; Aug. 6, 1985, 60-171865; Aug. 6, 1985, 60-171869; Sep. 6, 1985, 60-197078

Int. Cl.[4] B60K *41/18, 41/16*

U.S. Cl. 74—869 **7 Claims**

1. A control for an automatic transmission for an automotive vehicle having an engine, the transmission being adapted for shifting between different speed ratios and having a plurality of friction elements to effect shifting between speed ratios, the plurality of friction elements including an engine brake effecting friction element, the control comprising:

a fluid source;

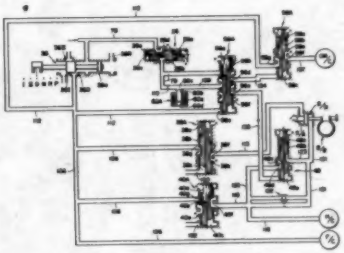
means communicating with said fluid source for generating a line pressure which is variable with opening degree of a throttle of the engine;

a timing valve;

a control valve for the engine brake effecting friction element;

electromagnetic means for generating a control pressure;

a shuttle valve communicating with said timing valve, said



control valve, and said electromagnetic means, said shuttle valve having a valve spool movable responsive to said line pressure between a first position where said control valve is under the control of said control pressure and said timing valve is not under the control of said control pressure, and a second position where said control valve is not under the control of said control pressure and said timing valve is under the control of said control pressure.

4,680,993

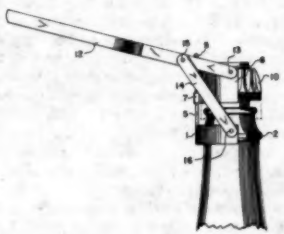
CHAMPAGNE BOTTLE OPENER

Jack M. Feliz, 2110 Southridge Dr., Palm Springs, Calif. 92264

Filed Jun. 20, 1986, Ser. No. 876,785

Int. Cl.[4] B67B *7/02*

U.S. Cl. 81—3.37 **3 Claims**



1. In a champagne bottle opener, the combination of:

a. a flanged yoke-shaped platform having vertically spaced upper and lower flanges engageable to the flanged neck of a champagne bottle;

b. a flanged yoke-shaped cork extractor and retainer having vertically spaced upper and lower flanges engageable to the external top and bottom flanges of the cork, said extractor and retainer and said platform having interengageable guide means for maintaining said extractor and retainer in a horizontal plane while moving vertically in relation to said platform; and

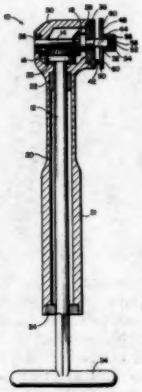
c. a single lever actuating means pivotally connected to said extractor and retainer and connected by a pivoted link to said platform, for moving said extractor and retainer vertically in relation to said platform;

d. with said platform and said extractor and retainer being laterally slideable into extracting position onto the corked bottle and with said cork being extracted by a single one-handed downward motion of said single lever.

4,680,994
SOCKET WRENCH WITH REVERSING RATCHET

Robert P. Singleton, Birmingham, Ala., assignor to Sidewinder Products Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 746,673, Jun. 20, 1985, Pat. No. 4,620,459. This application Sep. 3, 1985, Ser. No. 771,625
Int. Cl.[4] B25B *13/46, 17/00*
U.S. Cl. 81—57.29 4 Claims

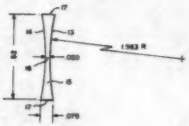


1. A socket wrench with reversing ratchet comprising: an elongated casing; a gear shaft mounted coaxially within said casing; a bevel gear mounted on one end of said gear shaft; a T-shaped handle member mounted on the other end of said gear shaft, said gear shaft being formed as an integral unit with the bevel gear so that rotation of said handle member results in direct rotation of said bevel gear, said gear shaft being in the form of a single straight continuous shaft from the bevel gear on said one end of the gear shaft to the T-shaped handle on said other end of the gear shaft; a pinion shaft mounted in said casing adjacent said bevel gear and extending perpendicular to said gear shaft; a bevel pinion mounted on one end of said pinion shaft in engagement with said bevel gear; a drive shaft mounted on said bevel pinion so as to be coaxial with said pinion shaft and extending outwardly from said casing; a pair of bushings mounted in said casing, with one end of said pinion shaft and one end of said drive shaft each being mounted in a respective one of said bushings; a planar cap member mounted on said casing, said cap member acting to secure the bushing in which said drive shaft is mounted; a drive stud mounted on said drive shaft for engagement with a workpiece; a ratchet wheel having a plurality of teeth around the circumference thereof, said ratchet wheel being mounted on said drive shaft and rotatable therewith; and means for releasably engaging said ratchet wheel to prevent rotation of said drive shaft, said engaging means including a pawl member mounted on said casing, said pawl member being free to move in a direction along its longitudinal axis and with means for biasing said pawl into engagement with said ratchet wheel, the plane of said longitudinal axis being coincident with the plane of said ratchet wheel, said pawl being mounted in a pawl casing having a pair of notches formed therein and so positioned relative to each other that said pawl may be received in either of said pair of notches upon being rotated about its longitudinal axis through an angle of 180 degrees, said pawl casing having a center notch corresponding to an angle of rotation of said pawl about its longitudinal axis by an angle of 90 degrees from either of said pair of notches, said pair of notches being positioned closer to said ratchet wheel than said center notch so that said biasing means allows said pawl to engage the ratchet wheel when positioned in either of said pair of notches while allowing said ratchet wheel to rotate free of engagement with the pawl when said pawl is in the center notch.

4,680,995
SCREWDRIVER

Philip R. LaRue, Meyersdale, Pa., assignor to Naphs, Inc., Meyerdale, Pa.

Filed Feb. 24, 1986, Ser. No. 833,083
Int. Cl.[4] B25F *1/00*
U.S. Cl. 81—437 5 Claims

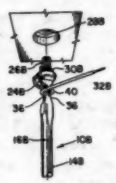


1. In a screwdriver bit having a shaft and driving faces disposed on opposite sides thereof said faces extending the entire width of the bit lengthwise of the bit edge, the improvement in which said oppositely disposed driving faces are concave-out arcuate faces having a radius of curvature of about 1.56 inches progressively decreasing in depth along said bit from said bit edge so as to form a bit edge having at its center a thickness of about 0.02 inches and at its ends a thickness of about 0.075 inches, whereby a single said bit is adapted to drive and to remove slotted-head screws having slots of different widths.

4,680,996
SCREWDRIVER

Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Apr. 18, 1986, Ser. No. 853,437
Int. Cl.[4] B25B *23/10*
U.S. Cl. 81—456 4 Claims



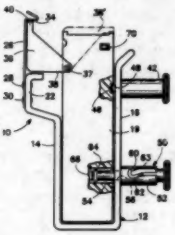
1. Improvements in a screwdriver of the type having a handle and a shank having a longitudinal axis extending forwardly of said handle and terminating at the distal end of said shank in a screw-turning blade having a plane generally parallel to said longitudinal axis of said shank and a screw engaging edge at its end, said improvements comprising along the length of said blade a rotational turn in said blade to offset the portion of said blade distally of said turn from the plane of the blade portion adjacent said shaft, and said rotated blade having in the distal portion a pair of arcuate cutouts, to thereby allow the sighting of the screw engaging edge by the user down the longitudinal axis of said shank during use of said screwdriver; and for engaging a coil of wire for holding a fastener on said blade.

4,680,997

VIDEO TAPE CASSETTE TOOL

LaVon F. Hancock, 5561 SE. Pueblo St., Hillsboro, Oreg. 97123

Filed Mar. 14, 1986, Ser. No. 839,558
Int. Cl.[4] B25B 3/00
U.S. Cl. 81—487 16 Claims



1. A hand tool for holding a video tape cassette of the type having a tape shield held closed by spring tension, said hand tool comprising:

means for clamping a video tape cassette into said hand tool; and

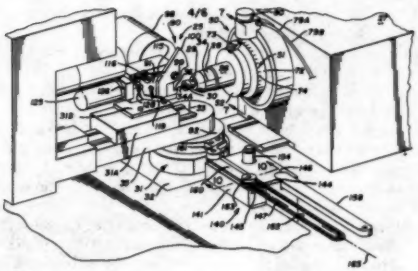
means affixed to said clamping means for holding a tape shield of the cassette in an open position against the spring tension.

4,680,998

TORIC LENSES, METHOD AND APPARATUS FOR MAKING SAME

Buford W. Council, Jr., Ruskin, Fla., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 28, 1984, Ser. No. 645,147
Int. Cl.[4] B23B 1/00, 5/40
U.S. Cl. 82—1 C 17 Claims



1. A method for generating a toric surface comprising the steps of:

mounting a lens blank onto which a toric surface is to be imparted on the spindle of a lathe;

rotating said spindle;

providing a cutting tool to shape the blank mounted on said spindle; moving said cutting tool through an arcuate path transversely of said spindle;

oscillating said cutting tool so that it moves through a range to cut a curve of first selected radius at the innermost incursion of its oscillation and at least a curve of second selected radius at its outermost retraction; and,

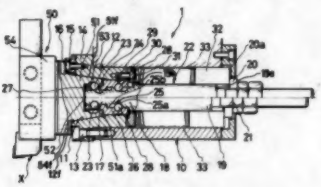
effecting synchronization of the tool oscillations with respect to rotation of the spindle to orient the curve of said second selected radius orthogonally to the curve of said first selected radius.

4,680,999

REPLACEABLE TOOL

Sadao Kojima; Hitoshi Abe; Fumio Ishizaki, all of Utsunomiya; Atusi Otani, and Hidefumi Shirotori, both of Tokyo, all of Japan, assignors to Kyoritsu Seiki Corporation and Hitachi Seiki Co., Ltd., both of Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 751,829
Claims priority, application Japan, Jul. 11, 1984, 59-142177; Jul. 11, 1984, 59-142178; Mar. 19, 1985, 60-53341
Int. Cl.[4] B23B 29/00, 31/10
U.S. Cl. 82—36 B 6 Claims



1. A replaceable tool comprising:

a tool holder having a head portion with a first end face, and a taper shank including a first taper face extending from said first end face, said taper shank having a locking bore formed in an end portion thereof on the side of a support means for said tool holder, said locking bore being formed with a circumferential fitting groove;

a taper sleeve including a second end face and a second taper face, for holding said first end face and said taper shank of said tool holder and said second end face and said second taper face of said taper sleeve abutting against each other, respectively;

locking balls;

a cylindrical draw collar slidably fitted in said locking bore in said taper shank, said draw collar being provided with through-apertures for receiving therein said locking balls engageable also in said circumferential fitting groove;

a draw rod slidably fitted in said cylindrical draw collar and having a locking part for fitting said locking balls into said fitting groove to lock said tool holder and an escape groove into which said locking balls can enter in a locking-released condition of said tool holder;

means provided to said taper sleeve for preloading said draw collar in the direction of pulling said tool holder; and

means provided to said taper sleeve for preloading said locking part to align it with said through-apertures in position, said circumferential fitting groove having a sectional configuration in said draw collar against which said locking balls abut.

4,681,000

FOOD PREPARATION PROCESS

Karen A. Wolters, Lake Sara, Knolls Subdivision, R.R. 2, Box 311-A, Effingham, Ill. 62401

Filed Jan. 23, 1985, Ser. No. 693,755
Int. Cl.[4] B26D 9/00
U.S. Cl. 83—862 19 Claims

1. A method for cutting a food material, having a predetermined depth defined by a proximal surface and a remote surface, into a desired, continuous, closed configuration, said method comprising the steps of:

(a) selecting a food material having said predetermined depth;

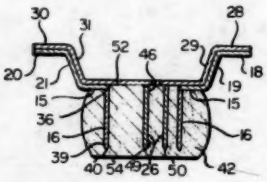
(b) cutting said desired configuration into said food material by inserting therein at the proximal surface blade means having a cutting edge defining at least the exterior outline of said desired, continuous, closed configuration;

(c) maintaining said cutting edge of the inserted blade means spaced from the remote end of the food material;

(d) removing said blade means from the food material while

leaving said cut configuration substantially intact in the food material;

(e) preventing the removal from said food material of said desired cut configuration when the blade means is removed by avoiding excessive compression of the food material when the blade means is inserted in the food material;



(f) slicing said food material, at an angle transverse to the direction of insertion of the blade means, into one or more slices each containing the desired configuration; and

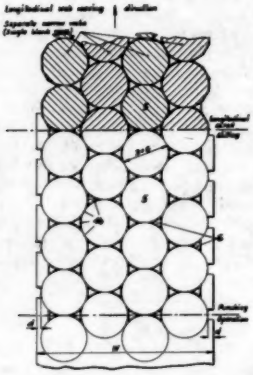
(g) separating said cut configuration in said substantially intact condition from the remainder of its slice.

4,681,001

METHOD OF MAKING SCROLL STRIP BLANKS

Werner H. Uehlinger, Arlesheim, Switzerland, and Jozef T. Franek, Chorleywood, Great Britain, assignors to KM-Engineering AG, Basel, Switzerland

Filed Jul. 1, 1985, Ser. No. 751,040
Int. Cl.[4] B23D *25/12*; B26D *1/62*
U.S. Cl. 83—37 **54 Claims**



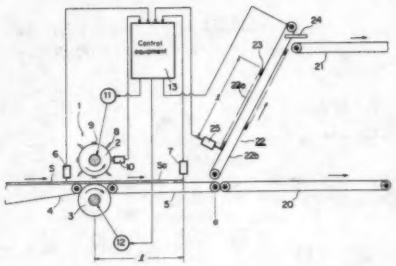
1. A method for the processing of coiled metallic material, which may be coated or laminated for further processing, comprising the steps of uncoiling said web and continuously cutting said web as it is being uncoiled such that said web is cut along a plurality of longitudinal scroll lines, each scroll line being formed from a plurality of straight scroll line sections, whereby said scroll lines divide said web into a plurality of strips from which polygonally-shaped blanks can be made, wherein each scroll line is wave-shaped, the scroll lines of each pair of adjacent scroll lines being symmetrical to each other about a longitudinal axis of said web, whereby said scroll lines form strips having wave-shaped longitudinal edges, the strips of each pair of adjacent strips being offset longitudinally relative to each other, some of said scroll line sections being parallel to a longitudinal axis of said web and some of said scroll line sections being non-parallel to a longitudinal axis of said web, each of said parallel and non-parallel scroll line sections being tangent to one of a plurality of imaginary circles, each circle having a center which is coincident with the center of a polygonal blank to be made from a corresponding one of said strips, some of said parallel scroll line sections forming valleys in a corresponding one of said scroll lines and some of said parallel scroll line sections forming peaks in a corresponding one of said scroll lines, and removing polygonally-shaped pieces of material from said web at locations which correspond to said valleys, whereby each strip has polygonally-shaped cutouts where said polygonally-shaped pieces are removed from said web.

4,681,002

CONVEYOR SYSTEM FOR CONVEYING VENEER SHEETS WITH SPACINGS THEREBETWEEN

Takashi Nakaya, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Division of Ser. No. 703,542, Feb. 20, 1985, abandoned. This application May 15, 1986, Ser. No. 867,427
Claims priority, application Japan, Feb. 22, 1984, 59-25147[U]
Int. Cl.[4] B65G *47/86*
U.S. Cl. 83—71 **2 Claims**



1. A conveyor system for conveying veneer sheets with spacings therebetween comprising:

supply conveyor means for supplying a one-piece veneer sheet in a predetermined direction;

rotary cutter means, operably connected to said supply conveyor means and receivable of said one-piece veneer sheet, for cutting said one-piece veneer sheet into a plurality of veneer sheets of predetermined length measured in said predetermined direction, said plurality of veneer sheets each having a pair of sides transverse to said predetermined direction;

delivery conveyor means, operably connected to said rotary cutter means and receivable of said veneer sheets of predetermined length, for conveying said plurality of veneer sheets in said predetermined direction in side-by-side relation;

lower conveyor means, receivable of veneer sheets of predetermined length conveyed by said delivery conveyor means, for conveying said received sheets in said predetermined direction in spaced part relation;

upper conveyor means for conveying veneer sheets of said predetermined length in said predetermined direction in spaced apart relation, said upper conveyor means disposed above said lower conveyor means;

stick-and-carry conveyor means, disposed prior to said lower conveyor means and between said delivery conveyor means and said upper conveyor means, for picking up every other veneer sheet of said plurality of veneer sheets of predetermined length conveyed by said delivery conveyor means in side-by-side relation and conveying said picked up veneer sheet to said upper conveyor means, said stick-and-carry conveyor means comprising a rotat-

ing endless belt having a circumferential length equal to an even number times said predetermined length of each veneer, said belt having on the circumferential periphery thereof alternate sticking and non-sticking areas, each said area having a circumferential length substantially equal to said predetermined length of said veneer sheets, said sticking areas, upon rotation of said belt, registering with and detachably engaging every other veneer sheet of predetermined length conveyed by said delivery conveyor means to pick up said detachably engaged veneer sheet from said delivery conveyor means and transport said picked up veneer sheet to said upper conveyor means;

separation means, operably engaging picked up veneer sheets conveyed by said stick-and-carry conveyor means, for detaching said picked up veneer sheets from said stick-and-carry conveyor means and guiding said detached veneer sheets to said upper conveyor means;

first sensor means provided on a upstream side of said rotary cutter means for detecting the delivery of veneer sheets;

second sensor means for sensing the rotating condition of said rotary cutter means;

third sensor means provided on a downstream side of said rotary cutter means for sensing a downstream side of a new sheet of veneer having said predetermined length;

fourth sensor means for detecting the rotating condition of said stick-and-carry conveyor; and

control means, operably connected to said first, second, third and fourth sensor means and to said rotary cutting means and said stick-and-carry conveyor means, for controlling operation of said rotary cutting means and said stick-and-carry conveyor means.

4,681,003

MECHANISM FOR DEPOSITION OF SHEET METAL

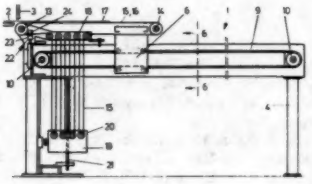
Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer Aktiegesellschaft Brugg, Brugg, Switzerland

Continuation of Ser. No. 603,635, Apr. 25, 1984, abandoned. This application Feb. 19, 1986, Ser. No. 831,107

Claims priority, application Switzerland, Apr. 26, 1983, 2222/83

Int. Cl.[4] B26D 7/06

U.S. Cl. 83—80 **11 Claims**



1. Apparatus for cutting planar workpieces and for depositing said cut workpieces in a stack comprising:

means for feeding said workpieces;

means for cutting said workpieces;

belt means defining a generally horizontal support surface receiving said workpieces from said feeding means;

first and second support roller means having said belt means extending thereabout with said belt means arranged to define said horizontal support surface on one side thereof between said first and second support roller means;

a fixed support frame having said first support roller means mounted thereon;

sled means mounting said second support roller means on said frame means for reciprocal movement relative to said first support roller means to expand and contract the length of said support surface;

tensioning means connected with said belt means for applying to said belt means a tensioning force holding said belt means taut about said first and second roller means;

clamp means engaging said belt means to prevent relative movement of said belt means about said first support roller means at least during movement of said second support roller means relative to said first support roller means in one direction; and

sensing means for sensing the position of said workpieces on said belt means;

said apparatus operating in response to said sensing means for controlling operation of said cutting means, said sled means and said clamp means to effect cutting of said workpieces to a predetermined length and deposition of said cut workpieces in said stack by reversed movement of said sled means and simultaneous actuation of said clamp means.

4,681,004

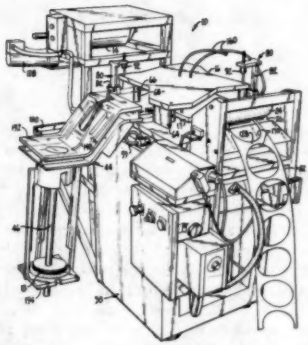
APPARATUS AND METHOD FOR FORMING DIE-CUT ARTICLES FROM SHEET MATERIAL

Kurt Waldner, 12260 Saraglen Dr., Saratoga, Calif. 95170

Filed Oct. 1, 1984, Ser. No. 656,612

Int. Cl.[4] B26D 7/18

U.S. Cl. 83—98 **12 Claims**



1. Apparatus for die-cutting articles from sheet material comprising:

a support having an upper end;

a lower die plate mounted on the support near the upper end thereof;

an upper die plate having a die thereon and guide means for shiftably mounting the upper die plate on the support for vertical movement toward and away from the lower die plate, said upper die plate normally being spaced above the lower die plate to present a path between the die plates for a strip of sheet material movable relative to the support;

quick release latch means carried by the support for engaging and removably holding the upper die plate on the support, said latch means including a shock absorber for damping the vibrations of the upper die plate;

means coupled with the upper die plate for biasing the same upwardly relative to said support;

magnetically actuated means coupled with the upper die plate for shifting the same downwardly relative to the support to die-cut the strip of material between the die plates to form an article;

fluid pressure means coupled with the die plates for causing a die-cut article to be urged transversely of said path and away from the die when the upper die plate is shifted upwardly relative to the lower die plate;

chute means coupled with the support for receiving the articles; and

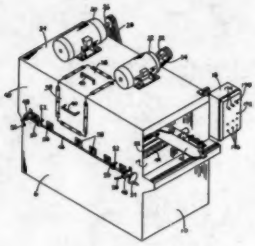
control means carried by the support for controlling the operation of the shifting means, the advancing means and the causing means.

4,681,005

TWIN ARBOR RESAW WITH A FENCE HAVING A CONTINUOUS ROTATABLE BELT

Edward J. Baranski, 558 Woodlawn Road East, Guelph, Ontario N1E 1C2, Canada

Filed Jun. 13, 1985, Ser. No. 744,335
Claims priority, application Canada, Jun. 13, 1984, 456533
Int. Cl.[4] B27B 7/04, 25/02, 27/02
U.S. Cl. 83—404.4 27 Claims



1. A resaw for splitting wood comprising:

(a) a housing having two sides, a front and a rear with an entrance for said wood being located at said front and an exit for said wood being located at said rear;

(b) twin arbors located between said entrance and said exit, each arbor having at least one saw blade mounted thereon, one arbor being positioned so that its blade or blades cuts the lower portion of wood being split, the other arbor being positioned so that its blade or blades cuts the upper portion of wood being split, each blade on one arbor having a corresponding blade on the other arbor, the arbors being offset from one another from front to rear so that a cutting area of the two arbors overlaps slightly;

(c) a workbed for said wood is located between said entrance and said exit, said workbed being formed from a series of elongated rollers, said rollers being rotatably mounted from side to side along said housing, adjacent rollers being spaced apart from one another from said entrance to said exit with a larger space being located between those rollers that are adjacent to a front and rear of said arbors, said rollers being rotatable in an appropriate direction to force wood being split towards said exit, said elongated rollers being connected to a suitable power source to cause said rollers to rotate;

(d) an adjustable fence extending along said workbed and slightly beyond said entrance and said exit, said fence having a continuous belt mounted on a side adjacent to said blades, said belt being rotatable in an appropriate direction so that said belt can force wood being split towards said exit when the resaw is in use, said fence being adjustable towards or away from said arbors;

(e) at least two side pressure rollers mounted in a spaced relationship to said adjustable fence on a side adjacent to said blades, said pressure rollers being automatically adjustable so that they can exert pressure towards said fence on any wood, within a predetermined size range, located between said rollers and said fence, said rollers being rotatable in an appropriate direction so that wood being split can be forced towards said exit when the resaw is in use; and

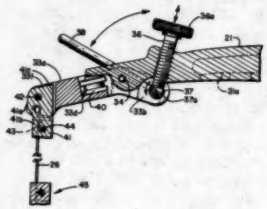
(f) at least one power source to drive the arbors, the adjustable fence and the two side pressure rollers.

4,681,006

BLADE TENSIONING DEVICE FOR SCROLL SAW

David Miller, Tupelo, Miss., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jul. 19, 1985, Ser. No. 757,004
Int. Cl.[4] B23D 49/04, 51/14
U.S. Cl. 83—782 11 Claims



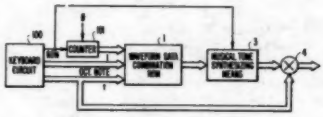
1. In a scroll saw having upper and lower reciprocable arms terminating in upper and lower ends having a saw blade connected therebetween, releasable blade tensioning means including a blade support member having a central portion pivotally mounted to an end of one of said arms, a first end extending generally along said one arm and a second end connectable to said saw blade, said blade support member being pivotable between a blade tensioning position and a blade tension releasing position, the improvement comprising manually operable cam means mounted on one of said first end and said one arm and engageable with separate manually adjustable means mounted on the other, and being constructed and arranged to hold said first end and said one arm apart in one position to move said blade support member to said blade tensioning positin, and to permit said blade support member to move to said blade tension releasing position in another position thereof, and said manually adjustable means mounted on the other of said first end and said one arm being engageable with said manually operable cam means to adjust the tension on the saw blade, said manually operable cam means being rotatable between said positions.

4,681,007

SOUND GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENT

Masataka Nikaido, Hirakata, and Sakurako Matsuda, Joyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 18, 1985, Ser. No. 746,119
Claims priority, application Japan, Jun. 20, 1984, 59-127062
Int. Cl.[4] G10H 1/46, 7/00
U.S. Cl. 84—1.1 26 Claims



1. A sound generator for an electronic musical instrument, comprising:

a keyboard;

a memory means for storing a plurality of waveform data combinations each of which represents a waveform obtained from a natural sound;

a selection means for decoding a keyboard information from said keyboard into an address signal for said memory means so as to thereby select one of said plurality of waveform data combinations, said keyboard information including at least a touch information which represents at

least one of a depressing speed and a depressing strength of a key of said keyboard;

a tone generating means for generating a tone from an output of said memory means; and

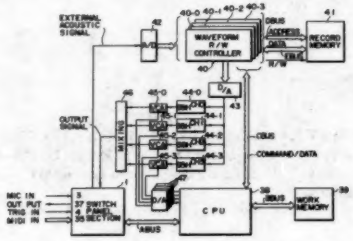
a loudness control means for controlling loudness level of the generated tone in response to said touch information.

4,681,008

TONE INFORMATION PROCESSING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

Shigenori Morikawa; Kohtaro Hanzawa; Hiroyuki Sasaki, and Hiroshi Morokuma, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,290
Claims priority, application Japan, Aug. 9, 1984, 59-167120
Int. Cl.[4] G10H *7/00*
U.S. Cl. 84—1.28 **30 Claims**



1. A tone information processing device for an electronic musical instrument, comprising:

analog-to-digital converting means for converting at least one analog external sound waveform signal into a digital waveform signal which represents a waveform corresponding to the waveform of said external sound waveform signal;

memory means for recording said digital waveform signal as outputted from said analog-to-digital converting means;

reading means for reading out said digital waveform signal recorded in said memory means at a rate corresponding to a designated tone frequency of a particular note;

digital-to-analog converting means for converting the digital waveform signal read out from said memory means into an analog sound signal which has the waveform determined by said digital waveform signal;

note frequency designating means coupled to said reading means for designating a pitch of the sound produced based on the analog sound signal derived from said digital-to-analog converting means; and

determining means coupled to said memory means and said reading means for determining start and end addresses of reading of said digital waveform signal recorded in said memory means in relation to the waveform of said digital waveform signal.

4,681,009

NECK APPARATUS FOR STRINGED MUSICAL INSTRUMENTS

James T. Mouradian, 40 Church St., Winchester, Mass. 01890

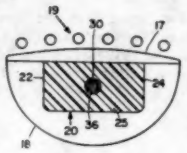
Filed Aug. 18, 1986, Ser. No. 897,616
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—293 **23 Claims**

1. An improved neck apparatus for stringed musical instruments comprising:

an elongate base;

a longitudinal channel disposed in said base;

an acoustically inert filler disposed in and intimately bonded to the inside surface of at least a portion of said channel; and



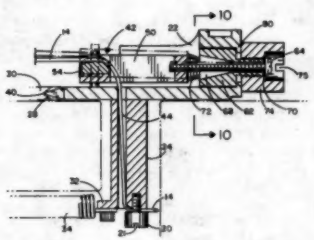
at least one elongate rod assembly suspended in said filler in said channel.

4,681,010

MULTIDIRECTIONALLY ADJUSTABLE VIBRATO DEVICE

Trevor A. Wilkinson, 1075 State St., A201, Redlands, Calif. 92373

Filed Sep. 16, 1986, Ser. No. 907,892
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—298 **6 Claims**



1. A vibrato device for guitars, comprising:

(a) a bridge;

(b) a plurality of string-supporting saddles mounted on said bridge for limited omnidirectional movement with respect thereto;

(c) a plurality of slotted spacing blocks slidably movable transversely with respect to said bridge;

(d) a plurality of clamp screws; and

(e) a plurality of pivot screws;

(f) said clamp screws cooperating with said spacing blocks to selectively clamp said spacing blocks to said bridge;

(g) each of said pivot screws passing axially through one of said clamp screws and through said slot in one of said spacing blocks to engage one of said saddles;

(h) said slot being so shaped as to prevent transverse movement of said pivot screw therein but allowing free vertical movement thereof; and

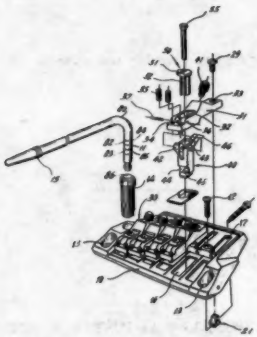
(i) said saddle being axially movable by rotating said pivot screw, the head of said pivot screw being biased against a vertical interior surface of said clamp screw;

(j) whereby said saddle is pivotally vertically movable about the head of said pivot screw.

4,681,011
TREMOLO ARM MOUNTING FOR STRINGED INSTRUMENT

Masao Hoshino, deceased, late of Owari Asahi, and by Yoshihiro Hoshino, legal representative, Nagoya, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan

Filed Jun. 5, 1985, Ser. No. 741,445
Claims priority, application Japan, Jun. 7, 1984, 59-084740
Int. Cl.[4] G10D 3/12
U.S. Cl. 84—313 11 Claims



1. A tremolo plate for a stringed musical instrument having a plurality of strings secured to the tremolo plate;

a tremolo arm having a handle section and a downward extension, the downward extension being connected to the tremolo plate, the handle section being movable by the instrumentalist;

a bearing sleeve mounted to the tremolo plate for receiving the downward extension of the tremolo arm, rigidifying means at the downward extension of said tremolo arm in the sleeve to rigidify the connection of the tremolo arm at the bearing sleeve for preventing shaking of the arm; the rigidifying means comprising a compressible member on the downward extension in the sleeve for engaging both the downward extension and the sleeve around it.

4,681,012
DRUMMER'S GLOVE

Michael J. Stelma, 20624 Hunt Club, Harper Woods, Mich. 48225, and Paul R. Dehem, 4662 Yorkshire, Detroit, Mich. 48224

Filed Aug. 18, 1986, Ser. No. 897,510
Int. Cl.[4] G10D 13/06; A41D 19/00
U.S. Cl. 84—422 S 2 Claims

1. In combination, a percussion surface in the form of a cymbal, acoustical or synthesized drum to be struck in a timed or rhythmic sequence, and a finger appliance for a percussionist which comprises a dense, hard plate having a rounded contour at the edges and the digital end to be aligned on the palm side of one or more fingers of the percussionist extending from the tip of the finger to the region adjacent the palm, and means to secure each said plate firmly to the finger in a manner to prevent articulation of the finger joints.

2. A method of producing percussion sounds by performing on percussion instruments in the form of a cymbal, acoustical or synthesized drums in a musical ensemble which comprises:

(a) providing a surface of a percussion instrument,

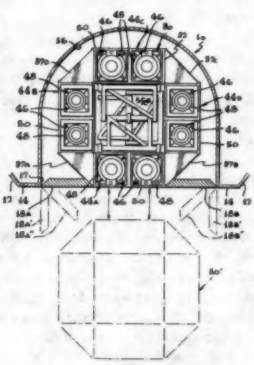
(b) providing an accessory on the palm side of one or more fingers of a hand of a percussion player in the form of a dense, stiff, hard plate extending from the finger tip to a region adjacent the palm in a manner to prevent articulation of the finger joints, and

(c) utilizing said accessory to strike the surface of a percussion instrument in rhythmic patterns to provide accompaniment for a musical performance.

4,681,013
ROTARY LAUNCHER SYSTEM FOR AN AIRCRAFT

Harold C. Farley, Thousand Oaks, and Robert G. Boles, North Hollywood, both of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Nov. 18, 1985, Ser. No. 799,089
Int. Cl.[4] F41F 3/06
U.S. Cl. 89—1.815 6 Claims



1. A rotary launcher system for an aircraft having a weapon bay, said weapon bay having an opening in communication with the exterior of the aircraft, the system comprising:

a plurality of doors mounted on said aircraft movable from an open position to a closed position sealing off a portion of the opening and forming a portion of the external contour of the aircraft over the opening; and

a rotary launcher comprising:

a frame member rotatively mounted within the weapon bay;

a plurality of weapon mounting assemblies mounted to said frame member at discrete locations thereabout and sequentially alignable with the opening upon rotation of said frame member, said weapon mounting assemblies adapted to mount at least one missile; and

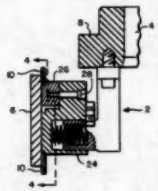
barrier means mounted to said frame member cooperating with said plurality of doors for sealing off the weapon bay from the exterior of the aircraft when any of said plurality of assemblies is aligned with the opening.

4,681,014

MISSILE AZIMUTH ALIGNMENT SYSTEM

Richard D. Gassler, Campbell, and Bettadapur N. Sridhar, Cupertino, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 23, 1986, Ser. No. 888,608
Int. Cl.[4] F41F 3/04
U.S. Cl. 89—1.816 7 Claims



1. A missile azimuth alignment system for preventing axial rotation of a missile while being loaded into a launching tube and for thereafter permitting shock-induced translations of the missile on a resilient missile support assembly comprising:

an azimuth alignment track having a first end and a second end and comprising a pair of parallel metallic rails having a slot formed therebetween;

a track follower block having a first slider shoe retainable in said slot of said track;

a pivot follower block pivotally affixed to said track follower block and having a second slider shoe retainable in said slot of said track; and

a missile support assembly follower block pivotally affixed to said pivot follower block;

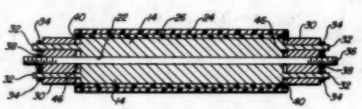
said slot in said track being widened at said second end thereof to release said second slider shoe from said track and permit translation of said missile support assembly follower block with respect to said track.

4,681,015

RAIL GUN BARREL WITH AXIALLY PRESTRESSED INSULATORS

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jul. 17, 1985, Ser. No. 756,038
Int. Cl.[4] F41F 1/02
U.S. Cl. 89—8 5 Claims



1. A rail gun barrel defining an elongated bore, said barrel comprising:

a pair of elongated, generally parallel conductive rails extending along opposite sides of said bore and being symmetrical abut a longitudinal axis of the bore;

a pair of elongated insulators disposed generally coextensively with said rails and circumferentially between them;

a pressure medium disposed about said rails and insulators;

an elongated tube generally coextensive with said rails and said insulators and containing said rails and insulators and said pressure medium;

said insulators being axially prestressed in compression;

said rails being axially prestressed in tension;

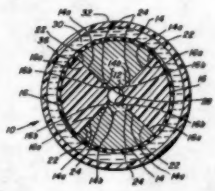
said rails and insulators being radially prestressed in compression.

4,681,016

RAIL GUN BARREL WITH GAS CONTAINMENT MEANS

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed May 2, 1984, Ser. No. 606,209
Int. Cl.[4] F41F 1/02
U.S. Cl. 89—8 3 Claims



1. A rail gun barrel assembly defining an elongated central bore for firing of a projectile, comprising:

structural containment means;

a pair of elongated rails supported by said structural containment means; and

a pair of elongated insulators supported by said structural containment means:

said rails and insulators being cooperative to define an elongated central bore and being supported alternately about the circumference of the bore so that said rails do not contact one another;

each said rail having a pair of opposite side surfaces, and each said insulator having a pair of opposite side surfaces, each of said side surfaces of each of said insulators being in contact with a respective one of the side surfaces of a respective one of said rails to define an interface therebetween;

said rails and insulators defining means to limit radial penetration of gas into said interfaces comprising four elongated gas containment channels extending generally parallel to said elongated central bore and spaced therefrom, a respective one of said gas containment channels being located at each said interface, each said channel providing a predetermined volume to permit expansion of gas penetrating said interfaces so as to reduce the pressure of said gas and prevent it from penetrating said interfaces beyond said channels.

4,681,017

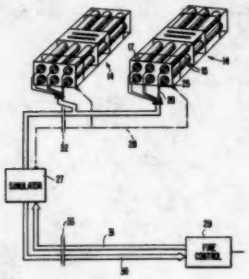
PRACTICE AMMUNITION SYSTEM

Nikolaus H. J. Fischer, Troisdorf; Christoph Mathey, Ockenfels, and Rainer Schöffl, Odenthal, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,441
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427165
Int. Cl.[4] F41F 3/055, 27/00
U.S. Cl. 89—29 16 Claims

1. A practice ammunition system for a rocket launcher having guide means for receiving an original rocket, the original rocket including an ignition means which, prior to launch, performs a data exchange via at least one data line with an external fire control unit for the rocket launcher, the practice ammunition system comprising a practice rocket having a rocket engine and an igniter for igniting the rocket engine thereof, the practice rocket being insertable in the guide means of the rocket launcher, simulator means external to the practice rocket arranged for connection with the practice rocket and the fire control unit, the external simulator means, after connection with the practice rocket and the fire control unit,

simulating functions of the ignition means of the original rocket for performing a data exchange with the fire control



unit and for enabling launching of the practice rocket from the rocket launcher.

4,681,018

CARTRIDGE FEED MECHANISM

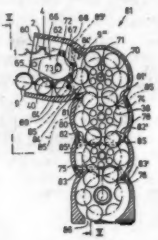
Rudi Beckmann, Rötenberg, Fed. Rep. of Germany, assignor to Heckler & Koch GmbH, Fed. Rep. of Germany

Division of Ser. No. 552,674, Nov. 17, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 873,813

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243746; Nov. 26, 1982, 3243744; Nov. 26, 1982, 3243745

Int. Cl.[4] F41D *10/04*

U.S. Cl. 89—33.04 **6 Claims**



1. A cartridge feed mechanism for feeding cartridges so that each cartridge moves in a direction transverse to its longitudinal direction, comprising at least two neighboring star wheels driven at equal circumferential speeds and in opposite directions, said star wheels having cup-shaped peripheral recesses forming common retaining means for a cartridge in the area of the smallest radial distance between said star wheel, guides to prevent the cartridges from sliding off the peripheral recesses, said guides being spaced from the axes of the star wheels to permit the transportation of the cartridges in both directions of movement of said star wheels, drive means coupled with the star wheels for selectively driving the star wheels in alternative directions of movement, and said guides including reversible guide elements for directing the cartridges into the peripheral recesses of the next following star wheels, and said guide elements provided on both sides of a plane extending to the axes of said two neighboring star wheels, and provided substantially in the area of a tangential plane associated with said two star wheels and extending perpendicularly to said plane through said star wheel axes.

4,681,019

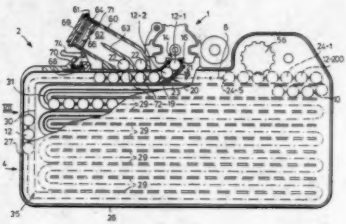
MAGAZINE FOR AUTOMATIC WEAPONS

Rudolf Brandl, Dornhan-Weiden, and Heinz Matt, Oberndorf, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,598

Int. Cl.[4] F41D *10/32*

U.S. Cl. 89—33.04 **3 Claims**



1. A magazine for use with an automatic firearm having means for receiving cartridges for firing, said magazine comprising an endless chain having cartridge carrying pockets for conveying cartridges toward a delivery opening when the chain is driven in one direction, a housing defining a path for said chain and the cartridges carried therein, said housing having a top wall defining said delivery opening so that cartridges can move upwardly to be received by said firearm receiving means, an auxiliary cartridge magazine for storing additional cartridges outside said path, said auxiliary magazine having a discharge end adjacent an auxiliary opening in said top wall, a movable closure below said discharge end to prevent additional cartridges from dropping into pockets of said chain without cartridges, and manually operable means for reversing said chain direction and moving said closure to permit an additional cartridge to drop into a pocket of said chain by gravity when no cartridge is present in that pocket of said chain that is present below said auxiliary opening.

4,681,020

CONTROL FOR A DETENT FOR A SLIDE FOR AUTOMATIC FIREARMS, ESPECIALLY FOR AUTOMATIC PISTOLS

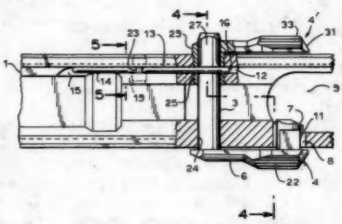
Vaclav Polanecky, Nivnice, Czechoslovakia, assignor to Agrozet, koncernovy podnik, Uhersky Brod, Czechoslovakia

Filed Sep. 28, 1984, Ser. No. 656,038

Claims priority, application Czechoslovakia, Sep. 30, 1983, 7153-83

Int. Cl.[4] F41D *11/06;* **F41C** *17/08*

U.S. Cl. 89—138 **5 Claims**



1. In an automatic firearm such as the automatic pistol, said firearm having a frame, a slide on the frame, a selectively operable detent for retaining the slide in retracted position on the frame, an oscillatable cross pin upon which the detent is mounted, a first frame control lever for the detent disposed upon a first side of the firearm, the control lever being fixedly

connected to said oscillatable cross pin, said oscillatable cross pin having a circumferentially disposed transverse groove within the frame of the firearm, and an elongated spring within the frame of the firearm extending generally longitudinally thereof and having a portion seated in said transverse groove in said oscillatable cross pin so as to prevent the axial escape of said oscillatable cross pin from the frame of the firearm, the improvement comprising

a collar slid on and removably attached to the end of said oscillatable cross pin remote from the first control lever, said collar being provided with a transverse slot disposed radially outwardly of said transverse groove in said oscillatable cross pin,

the said portion of the spring seated in said transverse groove in said oscillatable cross pin passing through said transverse slot in the collar, and

a second control lever fixedly connected to the collar and lying outwardly of the other, second side of the firearm.

4,681,021

DRIVING APPARATUS

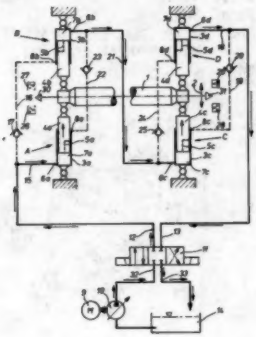
Otto Heinemann, Ennigerloh, and Heinz-Herbert Schmits, Rheda-Wiedenbrück, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,444

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519565

Int. Cl.[4] F01L *15/00*; F15B *15/22*

U.S. Cl. 91—178 **4 Claims**



1. In driving apparatus for producing to-and-fro movements of a driven machine part and including:

(a) four single acting rams which form two groups each of which has two rams acting in opposite directions,

(b) first and second pressure medium connections connected via a control valve operable alternately to connect said pressure medium connections to a pressure medium supply and a pressure medium discharge and,

(c) a plurality of non-return valves,

the improvement wherein:

(d) the four rams are formed by cylinders in each of which is a piston having a scavenging bore, each of the cylinders having a cylinder chamber connection and each also having, in a part of the cylinder covered by the associated piston, a scavenging duct connection, so that when a certain piston position is reached the scavenging bore connects the cylinder chamber to the scavenging duct connections,

(e) the first pressure medium connection is connected directly to the cylinder chamber connection of a first cylinder, and via a first non-return valve to the scavenging duct connection of a second cylinder which acts in the opposite direction to the first cylinder;

(f) the second pressure medium connection is connected via a second non-return valve to the scavenging duct connection of a third cylinder which works parallel to the first cylinder, and is directly connected to the cylinder chamber connection of a fourth cylinder which works in the opposite direction to the third cylinder;

(g) the cylinder chamber connections of the second and third cylinders are connected to one another via a connecting pipe to which the scavenging duct connection of the first cylinder is connected via a third non-return valve, and the scavenging valve connection of the fourth cylinder is connected via a fourth non-return valve; and

(h) the four non-return valves are connected to the respective cylinders in such manner that the second and third non-return valves are penetrable when the first pressure medium connection is under pressure and the scavenging bores in the pistons of the first and third cylinders have reached the appertaining scavenging duct connections, while the first and fourth non-return valves are penetrable when the second pressure medium connection is under pressure and the scavenging bores in the pistons of the second and fourth cylinders have reached the appertaining scavenging duct connections.

4,681,022

TWO-CYLINDER VISCOUS LIQUID PUMP WITH PIPE SWITCH

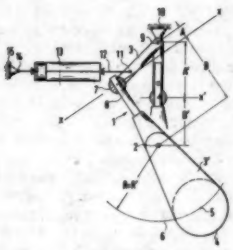
Friedrich Schwing, Gelsenkirchen, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,162

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435052; Jul. 5, 1985, 3524033

Int. Cl.[4] F04B *7/00*

U.S. Cl. 91—471 **7 Claims**



1. In a viscous liquid pump having a pair of pumping cylinders and a swing pipe alternately connecting one pumping cylinder with a conveyor pipe and exposing the other pumping cylinder, a drive mechanism for moving the swing pipe about a pivot point in an arcuate path of travel at varying speeds along said path, said drive mechanism comprising:

hydraulic motive power means; and

linkage means comprising a first lever extending from the swing pipe and a second lever (3) having one end pivotally mounted and the other end coupled to said first lever for applying force to said first lever to move the swing pipe along the arcuate path of travel, said hydraulic motive power means being coupled to said second lever, said linkage means having a first linkage distance (B) extending from the pivot point of the swing pipe to the point of force application on said first lever and measured normal to the direction of force application, said linkage means having a second linkage distance (A) between said first and second ends of said second lever and measured normal to the direction of force application, said linkage means being formed such that the ratio of the second and first linkage distances (A′/B′) when said swing pipe is in the center of

the arcuate path of travel is greater than the corresponding ratio (A/B) when the swing pipe is at the ends of the path of travel, thereby to provide greater speed to the swing pipe in the center of the path of travel than at the ends.

4,681,023

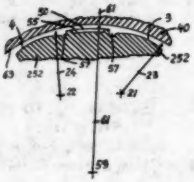
SLIDE BEARING PORTIONS ON OUTER FACES OF PISTON SHOES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 530,178, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 122,914, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 954,555, Oct. 25, 1978, abandoned. This application Sep. 30, 1985, Ser. No. 782,633

Int. Cl.[4] F01B *13/06*

U.S. Cl. 91—488 **3 Claims**



1. An improvement on outer slide faces of piston shoes in radial piston fluid flow facilitating devices, such as pumps, motors, compressors, transmissions, wherein said slide faces are the radial end faces of the piston shoes and are sliding along at least one respective guide face(s) of the piston stroke actuator of the device, while said guide face(s) is (are) of cylindrical configuration of a first radius around a first axis and thereby an annular guide face, said outer faces are at least partially substantially complementary configurated respective to portions of said annular guide face and wherein said slide faces of said piston shoes are interrupted by recesses which form fluid pressure pockets which are filled with an interior fluid from fluid containing cylinders through passages to constitute with their surrounding sealing lands hydrostatic bearing portions and said improvement comprising a curvature,

wherein said slide faces form medial portions which contain said hydrostatic bearings and are substantially part-cylindrical with said first radius around said first axis,

wherein said slide faces and piston shoes have a pair of extensions at opposite ends of said medial portions in the direction of the movements of said piston shoes,

wherein separating recesses are provided between said sealing lands of said hydrostatic bearings and said extensions,

wherein said extensions form bearing face portions with front face portions and rear face portions and gaps between said bearing face portions and respective portions of said guide face with front gap portions and rear gap portions,

wherein said front end portions and front gap portions are in the front direction of the movement of the shoe while said rear end portions and rear gap portions are rearward respectively to said front face portions and said front gap portions;

wherein said front face portions and said rear face portions form inclined face portions on both peripherial ends of said front and rear face portions to form hydrodynamic bearing face portions for multidirectional movements of said piston shoes,

whereby each of said front and rear face portions draws an exterior fluid into said front gap portions of said front and rear face portions at forwardly directed movements of said piston shoes and into said rear gap portions of said front and rear face portions at rearwardly directed movements of said piston shoes;

wherein said front face portions and said rear face portions form substantially equally sized and configurated but oppositely directed curved face portions with bearing face radii around first and second bearing face axes which are distanced in opposite directions from the vertical medial plane through the respective piston shoe, which are substantially equally distanced from the respective portion of said guide face and which are parallel to said first axis but distanced therefrom, and ,

wherein said bearing face radii are considerably shorter than said first radius around said first axis to form part cylindrical face portions to constitute said front and rear face portions,

whereby said front and rear face portions form narrow gap portions substantially in the middle between the front end and rear end of the respective face portion while each front end and rear end of the respective face portion forms thereover a wider gap to form hydrodynamic pressure field bearing face portions before and behind said middle and said narrow gap to draw in fluid through the respective wider gap of the respective end of the respective face portion of said front and rear face portions when said piston shoes move in one of the forward and rearward directions along said guide face,

whereby said front and rear face portions form hydrodynamic pressure fields before said medial narrow gaps at forward movements of said piston shoes and hydrodynamic pressure fields rearwards of said narrow gaps at rearwards directed movements of said piston shoes.

4,681,024

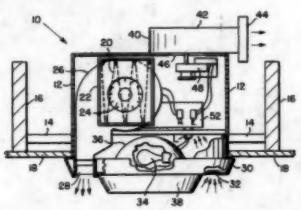
COMBINATION HEATER-LIGHT-VENTILATOR UNIT

Charles W. Ivey, Hope Mills, N.C., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed Jul. 29, 1986, Ser. No. 890,417

Int. Cl.[4] F24F *13/00*

U.S. Cl. 98—34.6 **6 Claims**



1. A combination heater-light-ventilator unit, comprising:

a cylindrical housing having a top member and an upright cylindrical wall supporting said top member, said housing supporting a heating subsystem, a lighting subsystem, and a ventilating subsystem,

said heating subsystem including a heater and a heat blower disposed within said housing, said heat blower adapted to discharge downward from said unit through a heat discharge outlet,

said lighting subsystem including a light source and a reflector disposed within said housing to direct light downward therefrom,

said ventilating subsystem including a vent blower mounted atop said housing, said vent blower communicating on its inlet side with the interior of said housing and adapted to discharge to a remote location through a vent discharge outlet, and

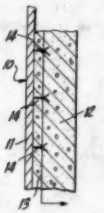
an annular grille mounted on the bottom of said cylindrical housing, said annular grille including a first arcuate portion thereof forming said heat discharge outlet of said heating subsystem, and a second arcuate portion thereof having ports permitting free passage of air from below to within said housing, said annular grille further supporting a light diffuser below said lamp.

4,681,025

CHIMNEY STACK HAVING ERODABLE LINER WITH ELECTRICAL GENERATING CAPACITY

John J. Carty, 2 Model Ct., Rocky Point, N.Y. 11778

Filed Apr. 22, 1986, Ser. No. 854,505
Int. Cl.[4] F23J 13/02
U.S. Cl. 98—58 5 Claims



1. A new and improved chimney stack capable of conveying hot gases generated in conjunction with industrial application to a height within the atmosphere sufficient to meet current pollution standards that is capable of being monitored to detect the degree of erosion occurring to it prior to sustaining structural damage, said chimney stack comprising:

(a) an outer structural support member capable of providing a stable structure capable of conveying hot gases into the elevated portions of the atmosphere;

(b) an inner liner subject to erosion by said hot gases structurally affixed to said outer structural support member thereby insulating said outer structural support member from contact with said hot gases passing through said chimney stack;

(c) electrical wiring embedded within said inner liner and arranged as part of an electrical circuit whose conductivity is monitored so as to detect the erosion of said inner liner;

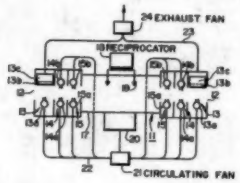
(d) monitoring circuitry incorporating said electrical wiring capable of detecting changes in the electrical conductivity of said circuitry thereby detecting the degree of erosion of said inner liner;

4,681,026

SPRAY COATING CHAMBER FREE FROM PAINTING MIST LEAKAGE

Akira Sato, Ibaragi, and Fumio Maki, Kitakyushu, both of Japan, assignors to Parker Arrester Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,410
Claims priority, application Japan, Jul. 30, 1985, 60-166901
Int. Cl.[4] B05B 15/12
U.S. Cl. 98—115.2 4 Claims



1. A spray coating chamber system free from leakage of paint mist floating within a pair spray chamber, which comprises, a paint spray chamber at the axially middle part of the chamber system and a plurality of air curtain compartments disposed at each axial outer side of said paint spray chamber, wherein said plurality of air curtain compartments comprises;

a pair of outermost air curtain compartments one of each being disposed at each outermost axial end and each being directed normal to said axis line and having at least one discharge duct at one transverse side and at least one suction duct at the other transverse side thereof;

at least one intermediate air curtain compartment disposed at each axial outer side of said spray coating chamber and having at least a pair of discharge ducts directed toward each other and normal to said axis line;

the region of the spray coating chamber starting from said paint spray chamber, passing through said intermediate air curtain compartment and said outermost air curtain compartment and up to the outlet opening constituting a passage for transferring the works to be painted;

each discharge duct in each air curtain compartment being spaced apart at a distance from the two side walls and rear wall surrounding said duct such that the air in said compartment can freely flow in the channels defined between said duct and said side walls and said rear wall; whereby

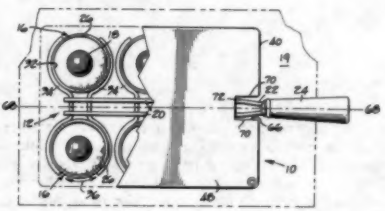
the air in the paint spray chamber can be returned to the discharge duct or ducts of each air curtain compartment and circulated after having been separated into air and paint particles by a separating means.

4,681,027

RAPID COOKING APPARATUS FOR EGG FRYING UTENSIL

Jon F. Meamber, P.O. Box 885, Yreka, Calif. 96097

Continuation of Ser. No. 899,611, Apr. 24, 1978, abandoned.
This application Jun. 3, 1980, Ser. No. 155,917
Int. Cl.[4] A47J 29/00
U.S. Cl. 99—422 7 Claims



1. In combination with a griddle and a portable egg frying utensil including a plurality of egg confining tubes for resting at an arbitrary location on said griddle, said tubes having upper surfaces that lie substantially in a common plane when said tubes rest on said griddle, and a first handle connected to said egg-confining tubes for carrying said utensil, said first handle extending upwardly beyond said common plane and having a predetermined width at a position in said common plane, the improvement comprising:

a bilaterally symmetric self-contained plate separable from said utensil, said plate having an upper surface and a thermally conductive lower surface, the lower surface having a first flat portion adapted to seat on said tubes to permit said plate to assume a first, superimposed position, and a second flat portion for contacting said griddle when said plate is removed from said utensil to permit said plate to assume a second, griddle-contacting position so that said griddle conductively heats said plate;

a second handle attached to said plate in a bilaterally symmetric manner and extending upwardly from said upper surface to permit a user to easily manipulate said plate between said first and said second positions;

said plate having portions defining a notch centrally located along an edge thereof, said notch having a dimension parallel to said edge that is slightly greater than said predetermined width, said notch being positioned along said edge to partially surround said first handle proximate said common plane when said first portion of said lower sur-

face is seated along said tubes and to restrict motion of said plate in a direction parallel to said edge;

said notch and said first handle portion being structured and co-functioning to enable said user to quickly position said plate in said first position on said tubes upon grasping said second handle and removing said plate from said griddle; and

said plate in said first position being formed to give off heat downwardly onto eggs positioned within said tubes to cook them partially from above and greatly reduce the cooking time thereof.

4,681,028

APPARATUS FOR THE PREPARATION OF HOT BEVERAGES, PARTICULARLY A COFFEE MACHINE

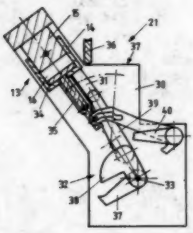
Arthur Schmed, Oberdürnten, and Hans-Peter Frei, Oetwil am See, both of Switzerland, assignors to Gesamat AG, Ballwil, Switzerland

Filed Feb. 26, 1985, Ser. No. 705,519

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407030

Int. Cl.⁴ A47J *31/00*

U.S. Cl. 99—289 R **11 Claims**



1. An apparatus for the preparation of hot beverages, particularly of coffee, comprising a housing, in the interior of the housing of the apparatus being provided, fixedly mounted, a fresh water inlet or a fresh water reservoir, a heating element for heating the fresh water, means for transporting the heated fresh water under pressure, and exchangeably mounted, a plug-in module incorporating a brewing chamber including an associated closure element and a beverage outlet, a means for pushing out and for removing leached-out beverage powder and a first driving means for driving said closure element associated with said brewing chamber, a second driving means for driving said means for pushing out and removing the leached-out beverage powder and clutch means including a driving member connected to said driving means and a driven member mounted to said plug-in module and operatively connected to said first and second driving means cooperating with said driving member and said driven member to be non-positively connected to each other if said plug-in module is inserted into said housing of the apparatus.

4,681,029

APPARATUS FOR TREATING SOYBEANS

Helmut Bartesch, Ravensburg, and Gerd Florin, Vorberg, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss Limited, Zürich, Switzerland

Continuation-in-part of Ser. No. 312,660, Oct. 19, 1981, Pat. No. 4,556,573. This application Oct. 28, 1985, Ser. No. 792,129

Claims priority, application Switzerland, Nov. 4, 1980, 8186/80

Int. Cl.⁴ A23L *1/20*

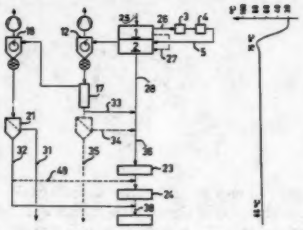
U.S. Cl. 99—483 **16 Claims**

1. An apparatus for the continuous preparatory treatment of soybeans in order to recover soybean oil and soybean meal, comprising:

a fluidized bed for applying to the soybeans composed of hulls and seeds contained in such hulls a substantially homogeneous heat treatment for a relatively brief amount of time insufficient for substantial heat diffusion to the seeds, so as to essentially apply heat only to the hulls and the outer surface of the seeds, in order to render the hulls brittle and to cause them to loosen from the seeds;

a corrugated roll mill arranged after said fluidized bed;

means for feeding the substantially homogeneously heat treated soybeans from the fluidized bed to said corrugated roll mill without any intermediate cooling thereof;



said corrugated roll mill subjecting the substantially homogeneously heat treated soybeans while in a heated condition to forces in order to split the soybeans, so that there are substantially formed split seeds and split hulls;

a separate impacting device arranged after the corrugated roll mill; and

means for delivering soybeans from said corrugated roll mill without any intermediate cooling to said separate impacting device where the split soybeans composed of the split seeds and split hulls are subjected to an impacting action in order to separate a predominant part of the split hulls from their related split seeds.

4,681,030

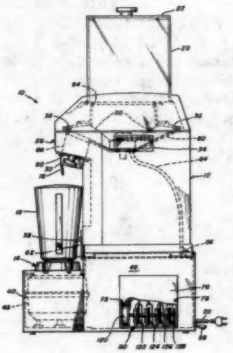
APPARATUS FOR PREPARING FROZEN DRINKS

John M. Herbert, 351 Normandy Dr., Norwood, Mass. 02062

Filed Feb. 20, 1986, Ser. No. 831,656

Int. Cl.⁴ A23G *9/00*; B01F *15/06*

U.S. Cl. 99—484 **8 Claims**



1. An apparatus for preparing frozen drinks comprising in combination:

means for preparing and delivering finely-divided ice,

a blender having a blender cup for receiving said ice, and

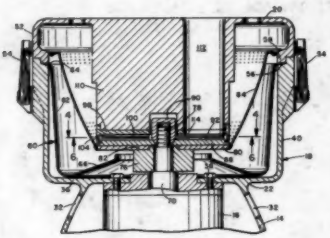
timing control means connected to said ice preparation means and to said blender for automatically controlling the commencement and amount of ice delivery, and the commencement and duration of blending during operation of the apparatus.

4,681,031

VEGETABLE AND FRUIT JUICE EXTRACTING MACHINE

John Austad, 3330 State St., San Diego, Calif. 92103

Filed May 1, 1986, Ser. No. 858,371
Int. Cl.[4] A23N *1/00*
U.S. Cl. 99—511 **9 Claims**



1. Apparatus for extracting juice from vegetable or fruit stock material comprising:

an extractor housing comprising:

a base housing;

an upper housing having a cylindrical outer wall having an open top end and a bottom end closed by a circular floor having a central aperture therein, said upper housing being joined to the base adjacent the circular floor, with the top end of the outer wall having a step formed therein along an inner edge with a sloping bottom which makes a predetermined angle toward the circular floor;

pulp discharge means extending outward from the cylindrical outer wall of the upper housing for forming a pulp discharge chute; and

apertured cover means having an interlocking wall positioned about its periphery configured to coincide with the upper housing outer wall, and having a step formed therein which is complementary to the step in the cylindrical outer wall;

a motor secured within the base housing having a rotatable shaft with a threaded end extending through the central aperture of the circular floor, the motor having a casing which extends through the central aperture a predetermined distance above the circular floor to prevent liquid penetration into the motor;

juice collection means positioned within the upper housing having an annular bottom so that the motor shaft extends therethrough and a collector side wall extending parallel to the cylindrical outer wall, said collection means side wall terminating in a rim which flares out from the collector side wall at a predetermined angle coincident with the predetermined angle of the outer wall step bottom, said juice collection means being positioned within the housing so that the flared rim rests in the outer wall step and is contacted by the cover interlocking wall so as to provide a substantially liquid tight seal;

spacer means positioned about said motor shaft between said motor housing and the threaded end, said spacer means having a surface extending above the annular bottom of the juice collection means;

screen basket means suspended interior of the collection means resting on the spacer means and having an aperture through which the threaded end of the motor shaft extends, operatively coupled to the motor shaft for spinning, having a conic shaped porous wall extending upward from a substantially flat support plate, said porous wall having openings of predetermined size for allowing the passage of juice therethrough but not pulp; a lower blade assembly positioned adjacent to the support plate inside the screen basket having a central aperture through which the threaded motor shaft extends and coupled to the motor shaft, comprising a circular cutter plate machined to have at least 8 vertically extending ridges from one side which form cutter blades, with said cutter blades extending outward along the surface of said plate from a center position;

a threaded nut disposed on the threaded end of said motor shaft having a beveled lower edge for engaging a beveled inner edge on the central aperture of said lower blade assembly when tightened so as to clamp said blade assembly and screen basket in place on said motor shaft;

a generally cylindrical plug extending down from the cover having a bottom surface substantially parallel to and spaced apart from the lower blade assembly, said plug having means for transferring the vegetables or fruit to a space between the plug and the lower blade assembly; and

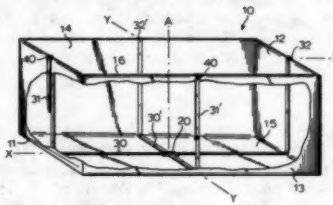
an upper cutter bar assembly secured to the bottom of the plug and spaced apart from the lower blade assembly by a distance predetermined by the vegetable or fruit to be processed and the preselected size of the openings in the porous wall, said upper cutter bar assembly being a circular plate having a plurality of raised ridges thereon.

4,681,032

BUNDLING DEVICE

Eve C. McDermott, 200 E. 84th St., New York, N.Y. 10028

Filed Apr. 15, 1985, Ser. No. 723,619
Int. Cl.[4] B65B *13/00*
U.S. Cl. 100—34 **47 Claims**



1. A bundling device which comprises:

(a) an assembly of individual, serially dispensable, flexible, elongated ties having a first terminal portion at one end thereof, a middle portion, and a second terminal portion at the other end thereof and having a length sufficient to encompass a stack of articles to be bundled, said assembly of ties being adapted to accept successive stacks of articles formed directly thereon; and,

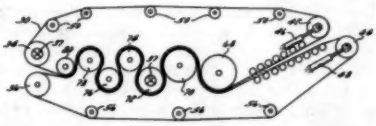
(b) means for maintaining the assembly of ties in a predetermined position relative to a stack of articles directly thereon, said means comprising a cartridge having an upper side and an underside, said cartirdge having means on its upper side for retaining a quantity of said ties and surface engaging means associated with its underside for its attachment to a surface.

4,681,033

DRIVE SYSTEM FOR BELT PRESS

Robert E. Crandall, Greendale; Kenneth F. Kosulic, Mukwonago; Thomas C. Rooney, Waukesha, and Larry C. Smith, New Berlin, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Division of Ser. No. 680,614, Dec. 11, 1986, Pat. No. 4,622,894.
This application Jul. 23, 1986, Ser. No. 871,948
Int. Cl.[4] B30B *5/06*
U.S. Cl. 100—118 **5 Claims**



1. In a belt press, such as for use in dewatering a non-plastic slurry, which includes a frame having a receiving end and a discharge end, a pair of endless foraminous belts disposed in

generally horizontally-flattened loops one above the other and supported on laterally-extending rolls mounted on the frame, and a series of laterally-extending pressure rolls also mounted on the frame and forming a dewatering section, said dewatering pressure rolls comprised of larger-diameter pressure rolls comprising a first low pressure section, and relatively smaller-diameter pressure rolls comprising a second high pressure section wherein the non-plastic slurry is deposited upon one of the belts, that belt becoming the loaded belt, and adjacent spans of the belt loops are adapted to sandwich the slurry between them and travel together from the receiving end to the discharge end of the press along a serpentine path over and under the low and high pressure dewatering rollers to effect gradually progressive dewatering of the slurry, the improvement comprising:

a first power-driven roll situated at the discharge end of the dewatering section in direct driving engagement with the loaded belt;

at least one additional power-driven roll situated within the high pressure dewatering section in direct driving engagement with the loaded belt, said drive rolls being effective in combination to pull the loaded belt through the high and low pressure dewatering sections with a uniform gradual increase in the tension in the loaded belt as it moves through said dewatering section; and

wherein the non-loaded belt is driven only by frictional engagement with the loaded belt through the progressively-thickened non-plastic slurry.

4,681,034

PROCESS FOR PRINTING A SUBSTRATE BY THE HOT-TRANSFER PRINTING METHOD

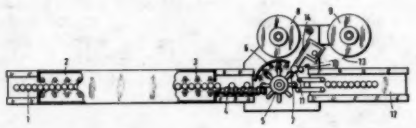
Herbert Schulzen, Wilhelmstr. 33, 6208 Bad Schwalbach 3; Wolfgang Köhler, Westring 55, Weiterstadt 2, and Kurt Schliessmann, Pfarrstr. 20, 6054 Obertshausen, all of Fed. Rep. of Germany

Continuation of Ser. No. 759,509, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 591,032, Mar. 19, 1984, abandoned. This application Feb. 13, 1986, Ser. No. 829,469

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310120

Int. Cl.[4] B41M *3/00, 1/30, 1/40*

U.S. Cl. 101—211 **13 Claims**



1. In a process for printing a substrate having a synthetic-resin surface which has an affinity for printing inks, said printing being a laser-induced hot transfer printing method, the process comprising the steps of laying onto the synthetic resin surface a transfer medium printed on a face surface with a dye image formed of dyes which are sublimable under the conditins of the process and transferrable into said synthetic resin, with the printed face surface facing the synthetic resin surface, transferring the dyes into the synthetic resin surface by first heating and then laser-light sublimating said dyes, including preheating said surface of the substrate to a temperature below the sublimation temperature of the dyes, and impinging a laser beam substantially uniformly for a treatment time of 0.01 second to 0.1 second over the unprinted back of the preheated transfer medium, the laser beam being of a wavelength in the range 2500 to 15,000 nm and of an intensity sufficient to cause the dyes to sublime of more than 80 percent above 220° C. and penetrate sufficiently substantially into the synthetic resin of the substrate in an abrasion resistant manner.

4,681,035

ROTARY OFFSET PRINTING MACHINE SYSTEM

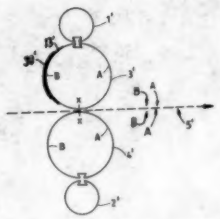
Ingo Kobler, Anhausen, and Josef Plantsch, Augsburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,143

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509044; Mar. 14, 1985, 3509045

Int. Cl.[4] B41F *5/22*

U.S. Cl. 101—217 **12 Claims**



1. Rotary offset printing machine system having

a plate cylinder (1, 2);

a rubber blanket cylinder (3, 4) in circumferential engagement with the plate cylinder;

a rubber blanket (30) applied over the circumference of the blanket cylinder;

and a blanket underlay (13) located between the rubber blanket and the surface of the rubber blanket cylinder (3, 4),

comprising, in accordance with the invention,

non-invasive means with respect to the blanket cylinder for eliminating, or at least alleviating, the effects of bending or oscillations of the rubber blanket cylinder including

regions formed in the rubber blanket underlay (6, 7, 8, 9; 5', 6', 11') of greater and lesser thickness, in which the arrangement of the respective regions of greater and lesser thickness, with respect to the position of said regions on the underlay, and the extent of said regions on the underlay, in longitudinal direction thereof, which will be circumferential direction when placed about the rubber blanket cylinder, is associated with a bending characteristic of an individual machine system operating at a predetermined speed such that the effects of bending and bending oscillations of the rubber blanket cylinder (3, 4) are effectively compensated with respect to printed copy material (5) by maintaining essentially uniform printing pressure against the copy material and counteracting bending of the respective rubber blanket cylinder by compensatory change in thickness of the underlay.

4,681,036

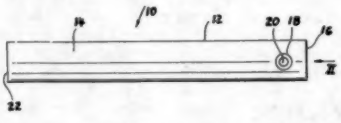
DELAY STARTERS

Jan H. A. Grobler, Wellington, South Africa, assignor to Bintech (PTY) Ltd., South Africa

Filed Jan. 7, 1986, Ser. No. 816,854

Int. Cl.[4] C06C *5/06;* **F42B** *3/10*

U.S. Cl. 102—275.3 **5 Claims**



1. A delay starter device, said device comprising an elongated cylindrical member of non-explosive material; a slow

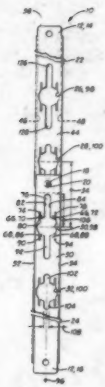
combustible non-explosive material provided in the cylindrical member; and a hollow tube of highly combustible non-explosive material, provided in at least one position in the cylindrical member and being adapted to receive a fuse cord inserted thereinto, for igniting by the slow combustible material and for, in turn, providing ignition of a fuse cord when in contact therewith.

4,681,037

TANGED CHARGE HOLDER

John A. Regalbuto, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Jan. 3, 1986, Ser. No. 816,172
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—310 **14 Claims**



1. A shaped charge carrier assembly apparatus, comprising:

at least one shaped charge including an outer case having an outer surface and a first shoulder extending radially outward from said outer surface; and

a carrier having at least one opening therethrough large enough to receive said outer surface of said case, and having at least a first pair of resilient tab means extending into said opening for frictionally engaging said outer surface of said case and for thereby holding said shaped charge in place relative to said carrier, said shoulder of said shaped charge abutting said carrier, said pair of resilient tab means including first and second resilient tabs defined by a first three spaced slots, said slots each having an open end communicating with said opening of said carrier, and a middle one of said slots being located between and defining adjacent sides of said first and second tabs.

4,681,038

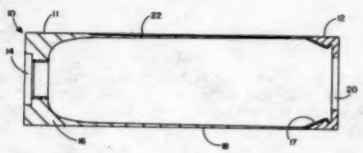
AMMUNITION CARTRIDGE CASE

William J. Washburn, San Clemente, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Filed Feb. 3, 1986, Ser. No. 825,122
Int. Cl.[4] F42B *5/26*
U.S. Cl. 102—464 **10 Claims**

1. A catridge case for use with telescoped ammunition and of the type containing a propellant charge for propelling a projectile through a bore of a gun barrel upon ignition of the charge in a gun system wherein the cartridge case is pushed through and ejected from the gun chamber after the projectile has been fired, the case comprising:

a hollow circular cylinder formed from a continuous wall surface and having at least one elongated recess in said wall surface, said recess being longer than half the length of said cylinder and terminating short of the ends of said



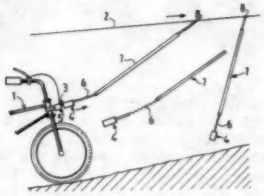
cylinder to cause a split of said wall surface along said recess in response to said ignition.

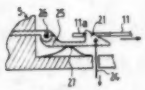
4,681,039

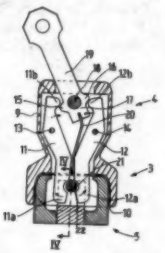
DEVICE FOR CONNECTION BETWEEN A TRACTION CABLE AND A BICYCLE WITH AUTOMATIC AND MANUAL DISENGAGEMENT

Jean Perrin, 14, Boulevard Henri Ruel, -94120- Fontenay-sous-Bois, France

Filed Nov. 21, 1985, Ser. No. 799,792
Claims priority, application France, Nov. 23, 1984, 84 17879
Int. Cl.[4] B61B *12/02*
U.S. Cl. 104—193 **22 Claims**







1. An apparatus for connecting a traction cable to a vehicle, wherein said traction cable is adapted to properly pull said vehicle along a normal path with respect to said cable, said apparatus comprising:

(a) a towing device connected to said traction cable;

(b) a towed device connected to said vehicle; and

(c) a safety device for coupling said towing and towed devices and comprising:

means for manually disconnecting said towed and towing devices; and

means for automatically disconnecting said towed and towing devices in response to at least one of the follow-

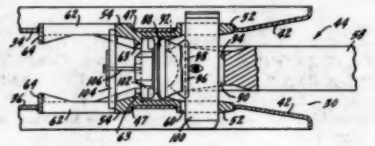
ing conditions: deviation of said vehicle from said normal path, and falling of said vehicle to the ground.

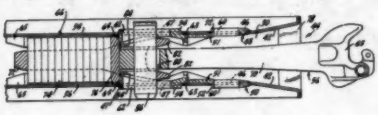
4,681,040

RAILROAD CAR WITH UNIVERSAL COUPLING CAPABILITY

Rene H. Brodeur, Wilmette, and Boris S. Terlecky, Woodridge, both of Ill., assignors to Trailer Train Company, Chicago, Ill.

Division of Ser. No. 597,642, Apr. 6, 1984, Pat. No. 4,589,558.
This application Feb. 7, 1986, Ser. No. 827,080
Int. Cl.[4] B61G *9/22, 5/04*
U.S. Cl. 105—3 **8 Claims**





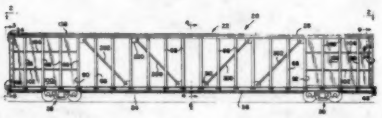
1. A railroad car including a centersill, having parallel sidewalls and single axle trucks connected thereto at opposite ends thereof to support the car upon rails, said centersill defining at least one coupler pocket open at an end of said car, and including a coupler arrangement having opposing sill side frames secured to each said sidewall in oppositely facing cooperating relation, each said sill side frame being generally longitudinally elongate in the direction of the longitudinal extent of said centersill and including a frontal draft key slot nearest the end of said car, a rearward draft key slot, inwardly directed stops intermediate said frontal draft key slot and rearward draft key slot and generally aligned with and facing the inwardly directed stop of the opposing sill side frame.

4,681,041

LIGHTWEIGHT CENTER BEAM RAILROAD CAR

William H. Harris, Michigan City, Ind.; James P. Klag, Crestwood, and Joseph W. Lam, Chicago, both of Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Nov. 27, 1985, Ser. No. 802,428
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] B61D *3/08, 17/00*
U.S. Cl. 105—355 **9 Claims**



1. A freight carrying railroad car having a predetermined length comprising:

a body supported at each end by wheel-containing truck means;

the body having a vertical center beam extending longitudinally the length of the car between bulkheads at each end of the car;

the center beam comprising a center sill, a top sill parallel to and spaced above the center sill, and a plurality of vertical spaced apart columns rigidly connected at their lower ends to the center sill and at their upper ends to the top sill;

at each end of the car, a vertical plate extending from the center sill to the top sill, and from the respective bulkhead at that end inwardly along the center sill;

each vertical plate being joined to the center sill, top sill, bulkhead and a plurality of said columns such that opposed facing ends of said vertical plates are spaced from each other a distance of at least about 60% of the length of said car between the bulkheads; and

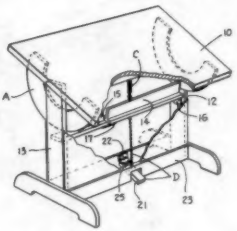
between the facing end of each of the vertical plates and the car length center, at least one bracing bar extending diagonally downwardly, toward the car length center, from the top sill to the center sill, so that when the car is subjected to impact loads the bars on one side of the car longitudinal center are placed in tension and the bars on the other side of the car center are placed in compression.

4,681,042

ADJUSTABLE TABLE TOP ASSEMBLY

Fred E. Roberts, 1322 Fourth Ave., Conway, S.C. 29526

Filed Feb. 20, 1981, Ser. No. 236,637
Int. Cl.[4] A47F *5/12*
U.S. Cl. 108—6 **1 Claim**



1. In a drafting table and the like, means adjusting the angular position of a pivotally adjustable flat top carried by an upright support comprising:

a pair of spaced oppositely disposed downwardly extending arcuate brackets carried by said top;

an elongated member carried for pivotal movement beneath said top into position wherein end portions thereof are in abutting relation to respective downwardly extending brackets immobilizing said top against pivotal movement;

said elongated member including a pair of links aligned in end-to-end relation substantially horizontally and pivoted intermediate opposed portions;

a spring connected to said elongated member maintaining same in said position immobilizing said top; and

foot pedal operated means which when pressed overcomes the force of the spring releasing said top for pivotal adjustment.

4,681,043

MODULAR MACHINE TABLE FOR PRODUCTION PLANTS

Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, A-4800 Attnang-Puchheim, Austria

Filed Jan. 28, 1985, Ser. No. 695,842
Claims priority, application Austria, Feb. 6, 1984, 366/84
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—153 **9 Claims**

1. A modular machine table for a production plant, comprising

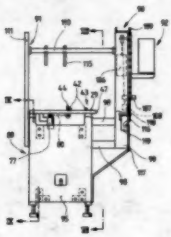
(a) two vertically extending plate-shaped support elements having upper end faces extending in a horizontal plane,

(1) the plate-shaped support elements being comprised of

a web and two end flanges defining a vertically extending recess to impart a channel-shaped cross section to the support elements,

(b) a plurality of transverse struts interconnecting the two support elements in at least two horizontal planes extending parallel to the plane wherein the end faces of the support elements extend,

(c) a self-supporting table plate supported on, and connected to, the end faces of the support elements,



(d) releasable coupling devices connecting the transverse struts and the table plate to the support elements, and for connecting adjacent ones of the machine tables to each other, and

(e) the web having bores receiving the releasable coupling devices for connecting the transverse struts to the support elements and the flanges having bores receiving the releasable coupling devices for connecting the adjacent machine tables to each other, the bores being positioned symmetrically with respect to a vertical center line of the web.

4,681,044

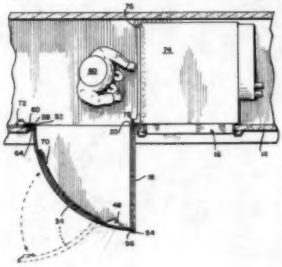
ACCESS DOOR SYSTEM

Ernest R. Dallman, 9200 Fanchon Dr., Zionsville, Ind. 46077

Filed Dec. 27, 1985, Ser. No. 814,191

Int. Cl.[4] G07G *5/00*

U.S. Cl. 109—24.1 **16 Claims**



1. An access system for access to an automatic teller machine enclosure defining an interior space and having a planar front surface defining a plane and containing an automatic teller machine that includes a panel that must rotate outwardly through said plane to a position substantially perpendicular to said plane, the system comprising:

a first door pivotable from a closed position to an open position having a hinged edge and an opening edge and having a first vertical height that lies in said plane when said first door is in the closed position;

an arcuate shaped wall having a first edge attached to said opening edge of said first door and having a vertical height substantially equal to said first vertical height; said wall extending along an arcuate path for substantially 90° and terminating at a second edge;

said first door and said wall cooperating when said first door is opened substantially 90° to provide a chamber substantially outside said enclosure and adjacent said plane defined by said front surface that is in direct communication with said interior space to permit said panel to rotate outwardly through said plane into said chamber to a position substantially perpendicular to said plane without interference;

a second door formed in said arcuate shaped wall and movable from a closed position to an open position to permit entry into said chamber when said chamber is substantially outside said booth;

a bottom wall attached to said exterior door and to said arcuate wall to provide a floor for said chamber capable of supporting an operator; and

means for alternately securing said first door in the closed position and in the open position.

4,681,045

TREATMENT OF FLUE GAS CONTAINING NOXIOUS GASES

Miro Dvirka, Garden City, N.Y.; George J. Psihos, Edina, Minn., and Joseph J. Cosulich, Syosset, N.Y., assignors to William F. Cosulich Associates, P.C., Woodbury, N.Y.

Filed Jul. 21, 1986, Ser. No. 888,394

Int. Cl.[4] F23J *11/00, 15/00*

U.S. Cl. 110—345 **100 Claims**

1. A method of reducing the noxious gases such as chlorides including hydrogen chloride and chlorine from the flue gases derived from the incineration of solid waste materials in a furnace with a combustion chamber and a combustion zone to substantially reduce the formation of dioxins for a cleaner effluent gas to the atmosphere, comprising:

introducing sodium bicarbonate into said flue gas of a furnace incinerating said waste materials,

positioning introduction of sodium bicarbonate for at least one location along the path of said flue gas at a temperature below about 1564° F. but not below about 518° F.,

heating said sodium bicarbonate in said flue gas for a time sufficient to drive off the water and carbon dioxide from said sodium bicarbonate,

forming sodium carbonate particles during said heating of said sodium bicarbonate, said sodium carbonate having a higher porosity to produce a greater reaction area on the surface of said particles,

contacting said porous sodium carbonate with chlorides in said flue gases for a sufficient time and temperature to react and product sodium chloride and thereby prevent their formation of dioxins, and

separating said sodium chloride from said flue gas to produce a cleaner gas for exit to the atmosphere.

4,681,046

METHOD OF UTILIZING DISTILLATION RESIDUES OF PHTHALIC ACID ANHYDRIDE OR MALEIC ACID ANHYDRIDE

Helmut Scharf, Schermbeck, and Wilfried Krix, Bottrop, both of Fed. Rep. of Germany, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,549

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524919

Int. Cl.[4] F23G *5/02*

U.S. Cl. 110—346 **11 Claims**

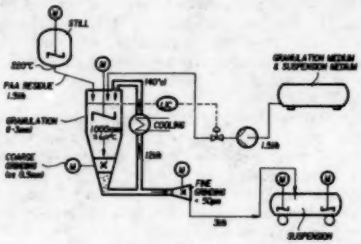
1. A method for utilizing distillation residues of phthalic anhydride or maleic anhydride, which comprises:

(a) cooling hot, liquid distllation residues of said phthalic anhydride or maleic anhydride, while flowing as a stream in a first organic liquid;

(b) comminuting said distillation residues solidifying in said

first organic liquid by means of a cutting edge rotating at high rpm to produce a granulate;

(c) suspending said granulate in a second organic liquid; and



(d) incinerating the suspension or converting the suspension into synthesis gas.

4,681,047

STRUCTURE OF AN UPPER HOOK PROVIDED WITH A HOLE AND USED IN SEWING MACHINES FOR MAKING OVEREDGE STITCHES

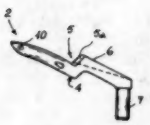
Franco Marchesi, Pavia, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Mar. 6, 1985, Ser. No. 708,837

Claims priority, application Italy, Jul. 31, 1984, 22763 B/84

Int. Cl.[4] D05B *57/06*

U.S. Cl. 112—162 **5 Claims**



1. Structure of an upper hook provided with a hole and used in sewing machines having a needle and a lower hook for making whipstitches in particular on medium-lightweight fabrics, comprising a tip curved in the direction of the lower hook and a bulge adjoining the said curved tip and facing the stitches already formed, and wherein the blade of the said upper hook has a broken-line profile, in a substantially vertical plane, which defines a shoulder for stopping and guiding the thread of the lower hook, which shoulder is located substantially in a middle position on the blade of the said upper hook.

4,681,048

SEWING MACHINE AND METHOD FOR CONTROLLING THE MOTION OF A WORKHOLDER

Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

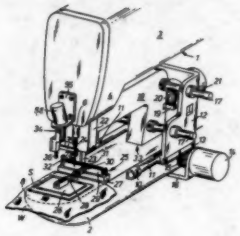
Filed Mar. 13, 1986, Ser. No. 839,359

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509526

Int. Cl.[4] D05B *21/00, 27/22*

U.S. Cl. 112—262.3 **8 Claims**

3. A method of effecting the sewing of a seam with a needle sewing into a stitch hole which seam is to be directed along at least two seam lines which are arranged along axes which are at an angle to each other, comprising using a first sensor to locate the edge of the workpiece to be sewn and, in response to the location sensed positioning a workholder in respect to the needle so that the needle will be positioned to begin an initial seam, starting the needle while advancing the workpiece in respect to the needle to form a first seam but before the first seam is finished, sensing where a second seam is to begin and forming the remaining first seam with a required spacing of stitches to bring the end of the stitch formation to the corner at



which the second seam is to be begun, and including locating the first sensor to locate an edge of the seam area, beginning the sewing by sewing through the stitch hole which is located by the first sensor and wherein a computer is used to program the entire seam formation which has an input for determining seam spacing, and wherein a secondary sensor is provided, at the location of the second of the formed seams after the first seam which senses the location at which the second of the formed seams will end on the second formed seam and revises the speed of the sewing machine so that the stitch will end at the end of the second seam.

4,681,049

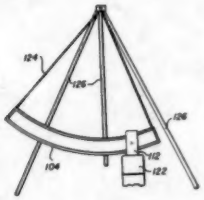
CURVED, UNIFORMLY BIASED STRUCTURAL FIBER FORMS

Frederick Vees, Eden Prairie, and Todd Drummond, Hopkins, both of Minn., assignors to Xerkon Company, Minneapolis, Minn.

Filed Dec. 2, 1985, Ser. No. 803,226

Int. Cl.[4] D05B *1/00*

U.S. Cl. 112—262.3 **5 Claims**



1. A process for making a dry fiber form of desired curved shape comprising the steps of:

attaching a dry structural fabric comprised of a plurality of plys of structural yarns, wherein the yarns of at least one ply are biased with respect to the axis of said fabric, to a form bearing an opening defining said desired shape in such fashion to completely occlude said opening by bending said fabric about said opening;

sewing a plurality of first courses of holding thread within that opening parallel to the curvature of said opening from end to end of said opening;

removing said sewn fabric from said form and sewing a plurality of second courses of holding threads along the edges of said fabric parallel to said first threads;

trimming the excess of said fabric to said desired shape.

4,681,050

BOBBIN IN RUN-OUT DETECTOR, AND A BOBBIN CHANGING MECHANISM INCORPORATING THE DETECTOR

Nikolaos Kosmas, 14 Anne Street, McKinnon, Victoria, Australia

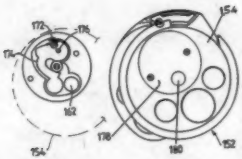
PCT No. PCT/AU84/00023, § 371 Date Oct. 23, 1984, § 102(e) Date Oct. 23, 1984, PCT Pub. No. WO84/03310, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 22, 1984, Ser. No. 672,258

Claims priority, application Australia, Feb. 23, 1983, PF 8163/83

Int. Cl.[4] D05B *45/00, 59/04*

U.S. Cl. 112—278 **20 Claims**



1. A lockstitch sewing machine having a bobbin and a stationary base, said bobbin being mounted within the base, said base including a peripheral wall which surrounds the bobbin, and means for defining a thread guide path from the bobbin and a run-out detector for sensing when the bobbin is empty, said detector comprising hook means carried by the base and engaged with the thread extending from the bobbin along said thread guide path such that the hook means is displaced from a first position by the bobbin thread when under tension;

bias means for returning the hook means to its first position as a result of loss in thread tension;

means for transmitting an energy beam;

means for receiving the energy beam; and

means for influencing the energy beam, said influencing means being linked to the hook means and movable relative to the path of said energy beam upon movement of the hook means to its first position consequent on loss of thread tension, said beam receiving means being responsive to such influence of the beam to provide a signal indicative of a run-out condition.

4,681,051

GUIDE DEVICE FOR THE WORKPIECE OF A SEWING MACHINE

Otto Kirch, Mehlingen, and Erich Willenbacher, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

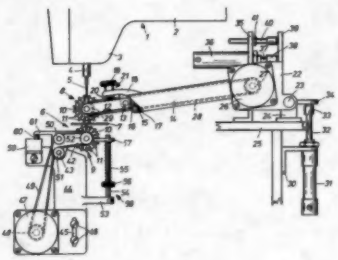
Filed Jun. 2, 1986, Ser. No. 870,248

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 8516184[U]

Int. Cl.[4] D05B *27/10*

U.S. Cl. 112—306 **8 Claims**

1. A guide device for sewing work moving in a sewing direction on a sewing machine having an arm extending in a longitudinal direction which is crosswise to the sewing direction, comprising at least one driven guide wheel rotating in a plane extending crosswise to the sewing direction and parallel to the longitudinal direction said wheel being moveable between an operating position in engagement with a sewing work and an inactive position spaced from the sewing work, and a support which is fixed at least when said guide wheel is in said operating position, a low-mass rocker for rotatably carrying said guide wheel, said rocker being movably connected to said support for movement between said operating and inactive positions, and spring means engaged between said support and



said rocker for urging said rocker to move said guide wheel toward said operating position.

4,681,052

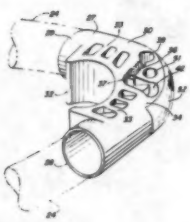
INHAUL BOOM END FOR SAILBOARD BOOM ASSEMBLY

Heinz F. Nedoluha, Salzburg, Austria, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 19, 1985, Ser. No. 811,023

Int. Cl.[4] B63B *15/00*

U.S. Cl. 114—98 **13 Claims**



1. An inhaul boom end part for a sailboard boom assembly having a pair of booms, the inhaul boom end part being generally V-shaped and having top and bottom surfaces and a pair of diverging tubular portions for attaching the inhaul boom end part to the booms, an arcuate surface between the tubular portions for engaging a mast of a sailboard, means for securing one end of a line for attaching the inhaul boom end part to the mast, said top surface having a slot therein and a jam cleat positioned in said slot and formed integrally with the inhaul boom end part for securing the other end of the line.

4,681,053

VESSEL SUCH A SHIP, BOAT AND THE LIKE PROVIDED WITH STABILIZING MEANS

Kemal Butka, 372 Central Park West, New York, N.Y. 10025

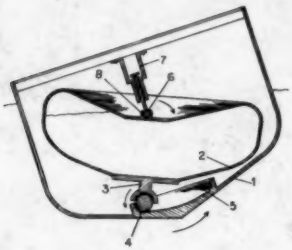
Continuation-in-part of Ser. No. 792,831, Oct. 25, 1985. This application Jul. 11, 1986, Ser. No. 884,289

Int. Cl.[4] B63B *39/02*

U.S. Cl. 114—122 **6 Claims**

1. A vessel, such as a ship, a boat and the like, comprising a hull having an inner hollow; a movable body located in said inner hollow of said hull; and means for guiding said movable body in said inner hollow of said hull and formed so that when said hull turns about any horizontal axis in a first direction under the action of waves, wind and the like, said movable body urges to turn said hull back about the same any horizontal axis in a second direction which is opposite to said first direction so as to stabilize the ship, said guiding means including a

spherical body, a guiding member with a guiding surface on which the spherical body can roll, and a holding member provided with a spherical receptacle and arranged to movably



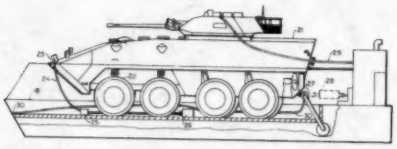
hold said spherical body, said hull and said movable body forming two elements, said guiding member being connected with one of said elements, while said holding member is connected with the other of said elements.

4,681,054

MARINE VESSEL AND METHOD FOR TRANSPORTING A VEHICLE

Mark S. Rice, Washington, D.C., and Paul D. Hunt, Alexandria, Va., assignors to CACI, Inc. - Federal, Arlington, Va.

Filed Aug. 28, 1985, Ser. No. 770,218
Int. Cl.[4] B63B *39/00*
U.S. Cl. 114—124 **5 Claims**



1. A method for transitioning the hydrodynamic hump of a marine vessel having a planing hull to obtain maximum speed with minimum power, the hydrodynamic hump being the hump in the drag versus speed relationship exhibited by the marine vessel as the marine vessel transitions from displacement to planing performance, said method comprising the steps of:

positioning movable ballast means at a predetermined aft first position in the vessel to obtain a first vessel trim angle at a predetermined vessel water speed less than the hump speed of the vessel;

shifting said ballast means forwardly in the vessel to change the longitudinal center of gravity of the vessel in dependence on the vessel water speed as the vessel water speed approaches the hump speed of the vessel so as to obtain a second vessel trim angle for passage of the vessel through the hump speed to the running speed of the vessel.

4,681,055

ADAPTER SYSTEM FOR MARINE AUTO PILOT

John F. Cyr, 41 Kindred Ave., Stuart, Fla. 33494

Continuation-in-part of Ser. No. 445,245, Dec. 20, 1982, abandoned. This application Dec. 5, 1985, Ser. No. 804,870
Int. Cl.[4] B63H *25/04*
U.S. Cl. 114—144 E **7 Claims**

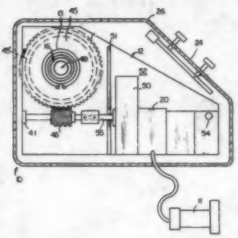
1. A system for enabling selective manual or autopilot control of a craft, for use with an autopilot device providing error signals to maintain a craft's heading in a pre-selected direction, the system is adapted for mounting between the steering wheel of the craft and the steering wheel shaft thereof, the system comprising:

(a) a system housing connectable between said steering wheel and said steering wheel shaft;

(b) a servo mechanism in said housing electro-mechanically communicating with said autopilot device, said servo mechanism having a mechanical output;

(c) a servo interface in said housing, connected to said mechanical output of said servo mechanism, said servo interface connected to a first gear;

(d) an adapter in said housing connected between said steering wheel and said wheel shaft, said adapter configured for ease of installation of said autopilot device between said steering wheel and said steering wheel shaft without



need for specialized hardware, said adapter connected to a second gear; and

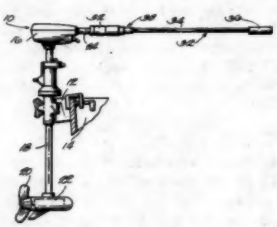
(e) means for selective mechanical co-action of said adapter and said servo output, said co-action means providing both an autopilot control of said steering wheel shaft and, alternatively, providing normal manual control of said steering wheel shaft, said co-action means further comprising means for selectively coupling and decoupling of the mechanical output of said servo mechanism to and from said adapter, said coupling and decoupling including radial displacement means to non-frictionally engage or disengage, respectively, said first gear from said second gear, said second gear being stationary relative to said first gear.

4,681,056

OUTBOARD MOTOR EXTENSION HANDLE ASSEMBLY

Dennis J. Friedle, Lake Villa; Richard P. Kolb, Gages Lake, and Gaylord M. Borst, Highland Park, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 4, 1985, Ser. No. 784,171
Int. Cl.[4] B63H *21/26*
U.S. Cl. 114—146 **28 Claims**



1. A marine propulsion device comprising a propulsion unit adapted to be pivotally mounted on a boat for pivotal movement relative to the boat about a generally vertical steering axis, said propulsion unit including a rotatably mounted propeller, and a powerhead drivingly connected to said propeller, a steering handle connected to said propulsion unit and extend-

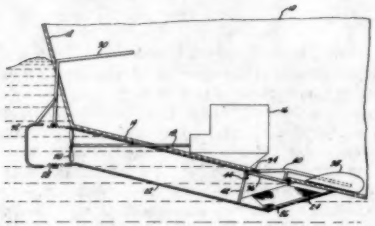
ing generally horizontally therefrom for causing pivotal steering movement of said propulsion unit in response to lateral movement of said steering handle, and an extension handle assembly removable attached to said steering handle and including an extension handle, a coupling member including a main portion connected to said extension handle and a plurality of fingers spaced around said steering handle and having respective inner ends pivotally connected to said main portion, and respective outer ends movable outwardly from said steering handle, and cylindrical sleeve means having a fixed inner diameter, surrounding said coupling member, and being slideable longitudinally of said coupling member between a first position in surrounding relation to said main body and clear of said fingers and a second position longitudinally spaced from said first position and in surrounding relation to said fingers with said outer ends thereof located radially inwardly such that said fingers grasp said steering handle.

4,681,057

PUMPING SYSTEM FOR SHIPS

David Girag, 355 W. Windsor Rd., Glendale, Calif. 91204

Filed Mar. 12, 1985, Ser. No. 710,913
Int. Cl.[4] B63B *13/00*
U.S. Cl. 114—183 R **3 Claims**



1. A pumping system for a boat having a hull and a submerged propeller for propulsion, comprising

a tube surrounding the propeller and extending forwardly beneath the hull;

an opening through the hull in communication with the interior of said tube forwardly of the propeller; and

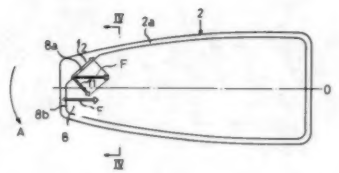
a door pivotally mounted relative to the hull within said tube, said door alternatively controlling communication through said opening and communication through said tube forwardly of said opening.

4,681,058

SMALL WATERCRAFT WITH ASYMMETRICAL BOW PORTION

Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 27, 1985, Ser. No. 769,711
Claims priority, application Japan, Aug. 28, 1984, 59-179012
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—271 **1 Claim**



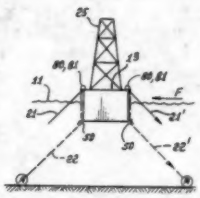
1. A small watercraft comprising a hull having a fore section and rear section, an engine for propelling the watercraft and auxiliary machinery of heavy weight supported at the fore section of the hull, said watercraft being steered by a rider on the rear section of the hull, and wherein said fore section comprises a bow portion which sinks below the water surface when said small watercraft floats on the water without the rider, but does not sink below the water surface when said small watercraft floats on the water with the rider, only said bow portion having an outer surface whose form is arranged asymetrical with respect to the center line of said hull, whereby when the rider is not on the rear section of the small watercraft, it will automatically be propelled by said engine in a circle.

4,681,059

ROLL RESTRAINT OF ANCHORED VESSEL

William A. Hunsucker, 3741 Prestwick Dr., Los Angeles, Calif. 90027

Continuation of Ser. No. 537,430, Sep. 29, 1983, Pat. No. 4,531,471, which is a continuation of Ser. No. 396,633, Jul. 9, 1982, abandoned. This application Jun. 6, 1985, Ser. No. 742,222
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] B63B *21/50*
U.S. Cl. 114—293 **23 Claims**



1. In combination with a floating vessel having a longitudinal axis and a transverse axis, and an upper portion, including a deck with heavy equipment mounted thereon,

(a) means for anchoring the vessel at a selected site on a body of water, such that the location and orientation of said vessel is kept approximately constant for adverse weather conditions which produce wind and wave forces which act on said vessel parallel to the transverse axis of the vessel,

(b) said means including anchor lines effectively attached to the vessel and also extending away from the vessel to transfer loading to the vessel at upper and lower locations associated with the vessel and acting in cooperation such that during said adverse weather conditions rolling and tilting of said vessel are minimized and said vessel is maintained approximately upright, each anchor line extending separately and individually to an individual anchor.

4,681,060

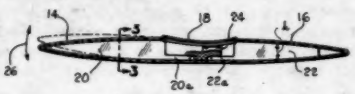
KAYAK FRAME SECTION AND METHOD

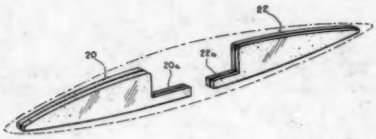
William E. Masters, 313 Dogwood La., Easley, S.C. 29640

Filed Oct. 7, 1985, Ser. No. 784,728
Int. Cl.[4] B63B *35/72*
U.S. Cl. 114—347 **20 Claims**

1. A method of constructing a frame section for a high performance kayak having a flexible hull constructed from a flexible skin enclosure wherein bending moments in a pitch direction are effectively resisted without significantly increasing its weight, said kayak being of the type having longitudinal frame sections located internally in the bow and stern portions of the flexible hull enclosure, said method comprising the inclusion in said frame sections of a generally rigid thin web member which effectively resists bending moments in a pitch direction, and including on each side of said thin web member a generally resilient lightweight foam block affixed to said web member which effectively reduces lateral buckling and warp-

ing of said thin web member under bending moments while providing a composite frame section which is within pre-





scribed weight limitations to maintain the performance of the hull.

4,681,061

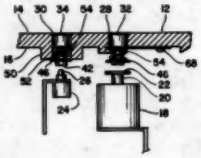
BUTTON INDICATOR AND SWITCH ASSEMBLY

Robert F. Dvorak, Mount Vernon; Charles E. Netolicky, Cedar Rapids, and Neil R. Palmer, Swisher, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,209

Int. Cl.[4] G08B 5/02

U.S. Cl. 116—279 **3 Claims**



1. A trip indicator and reset assembly for a circuit breaker having a trip indicating solenoid with a plunger movable between a trip position and a reset position comprising:

a cover for said circuit breaker having a top surface and a bottom surface and a hole in axial alignment with said plunger;

a button separable from said plunger having a head portion and a reduced diameter base portion, said head portion being shaped and dimensioned to pass through said hole and having a collar portion adjacent said base portion;

a leaf spring having a mounting portion secured to said bottom surface of said cover and having an extending leaf portion, said leaf portion including an opening in registration with said hole, said opening shaped and dimensioned to permit passage of said base portion of said button while preventing passage of said head portion of said button; a retaining ring secured to said base portion of said button; and a coil spring encircling said base portion of said button intermediate said leaf spring member and said retaining ring, said coil spring biasing said button toward a position having said collar portion engaged with said leaf spring, said leaf spring resiliently positioning said button at an initial position within said hole while permitting said button to be moved to a first position indicating a trip condition in response to said plunger moving to said trip position and also permitting said button to be moved in an opposite direction past said initial position to a second position to move said plunger to said reset position, said leaf spring resiliently biasing said button towards said initial position in response to said button being moved between said initial position and said second position.

4,681,062

COATING APPARATUS

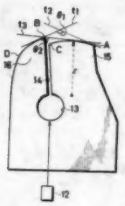
Norio Shibata; Hideo Takeda; Tsunehiko Sato, and Yasunori Tanaka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 14, 1985, Ser. No. 733,817

Claims priority, application Japan, May 14, 1984, 59-94657

Int. Cl.[4] B05L 5/02

U.S. Cl. 118—410 **8 Claims**



1. A coating apparatus of the extruder type which applies a coating solution onto the surface of a flexible support running continuously along rear edge and doctor edge surfaces by continuous extrusion of the coating solution from a frontmost end of a single slot, the improvement wherein said rear edge surface is curved and said doctor edge surface is smoothly curved in an arcuate fashion having a constant radius, and an exit end at a point B of a slot at a rear edge surface in a cross section of said coating apparatus is located at a position that satisfies the relation $\theta_1 < \theta_2 < 180°$, where θ_1 is an angle formed by a tangential line drawn to said rear edge surface at said point B and a tangential line drawn to said doctor edge surface at a point A at a downstream end of said doctor edge surface in a cross section of said coating apparatus, all of said apparatus being contained within an interior of said angle θ_1, and θ_2 is an angle formed by said tangential line drawn to said rear edge surface at said point B and a tangential line drawn from said point B to said doctor edge surface, all of said apparatus being contained within an interior of said angle θ_2.

4,681,063

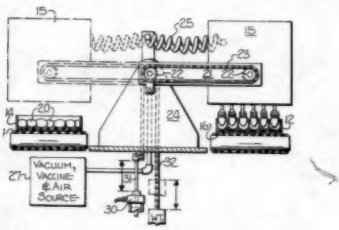
HIGH SPEED AUTOMATED INJECTION SYSTEM FOR AVIAN EMBRYOS

John H. Hebrank, Durham, N.C., assignor to Embrex Inc., Raleigh, N.C.

Filed Jul. 2, 1986, Ser. No. 881,121

Int. Cl.[4] B65G 59/04

U.S. Cl. 119—1 **27 Claims**



1. A device for simultaneously injecting a plurality of eggs of varying sizes with fluid substances, said device comprising:

suction means for simultaneously engaging and lifting a plurality of individual eggs from their respective upwardly facing portions; and

injection means cooperating with said suction means for injecting the eggs while the eggs are engaged by said suction means.

4,681,064

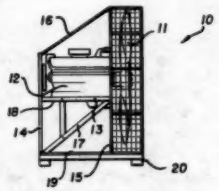
MOBILE FAN FOR POULTRY FARMING

William E. Lilliston, Sr., Salisbury, Md., and William E. Lilliston, Jr., 1311A Middle Neck Dr., Salisbury, Md. 21801, assignors to William E. Lilliston, Jr., Salisbury, Md.

Filed Aug. 26, 1985, Ser. No. 769,118

Int. Cl.[4] A01K *31/18*

U.S. Cl. 119—21 **2 Claims**



1. A method of rearing poultry in poultry houses which includes the steps of:

a. assembling a gasoline engine driven mobile fan constructed and arranged to be moved bodily from place to place and from time to time;

b. cooling the poultry houses with said mobile fan just before the catch-out process begins;

c. ventilating the said poultry houses with said mobile fan during the catch-out process;

d. cooling the poultry with said mobile fan while holding the poultry for further processing; and

e. simultaneously protecting said poultry and the poultry workers against respiratory illnesses by reducing the moisture content of poultry manure in said poultry houses and dispersing the odors therefrom.

4,681,065

MULTIBED FLUIDIZED BED BOILER

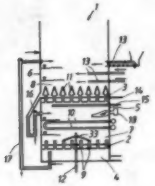
Jörgen Bergkvist, Finspong, Sweden, assignor to ASEA STAL Aktiebolag, Finspong, Sweden

Filed Jun. 26, 1986, Ser. No. 879,052

Claims priority, application Sweden, Jun. 28, 1985, 8503222; Jan. 24, 1986, 8600311

Int. Cl.[4] B09B *3/00*

U.S. Cl. 122—4 D **18 Claims**



1. A method of operating a multibed fluid bed boiler having at least two fluidizable beds aranged one after the other, in which conventional fuel is supplied to the first bed and in which the combustion of this fuel takes place in the first bed and in at least the immediately following bed, comprising the steps of

supplying an alternative fuel to the second bed in order to be burnt there, thus obtaining a simplified fuel feed to the second bed as well as increased protection against clogging of nozzles supplying gas from the first bed to the second bed, and feeding flue gas from a following bed into the combustion space above the first bed for increasing the temperature and the fall of pressure across the nozzles supplying gas to the second heel in the event of low or no combustion in the first bed.

4,681,066

BOILER FOR BOILING MASH OR WORT

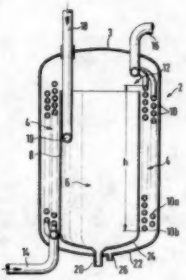
Martin Widhopf, Freising-Pulling, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,667

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501805

Int. Cl.[4] F22B *5/00*

U.S. Cl. 122—234 **4 Claims**



1. A boiler for boiling mash or wort comprising an elongated upright cylindrical boiler body closed at the top and bottom, an internal cylindrical partition open at the top and extending around the interior of and spaced from the periphery of the boiler body dividing said body into an inner precipitation section and a surrounding outer heat exchange section, helical pipe conduit circling around the outer periphery of the internal partition in the heat exchange section of the boiler and extending over substantially the full height of the boiler with said partition being in coaxial relationship with said helical pipe conduit and the boiler body and extending over substantially the full height of said helical conduit, a supply conduit in the bottom of the boiler for supplying mash or wort to be heated to said helical conduit and a discharge conduit in the top of the boiler for discharging heated mash or wort from said helical conduit and means for supplying heated mash or wort to and for withdrawing precipitated mash or wort from said precipitation section of said boiler.

4,681,067

LIQUID-COOLED ENGINE OF THE VERTICAL SHAFT TYPE

Shinichi Tamba, Kakogawa; Miyake Hitomi, Kobe; Fukui Noboru, Kakogawa, and Akio Miguchi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 11, 1986, Ser. No. 872,833

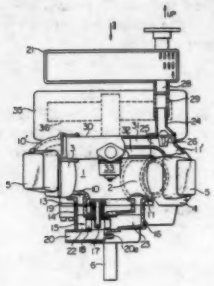
Claims priority, application Japan, Jun. 12, 1985, 60-127834; Jun. 13, 1985, 60-128911

Int. Cl.[4] F01P *3/02*

U.S. Cl. 123—41.1 **4 Claims**

1. In a liquid-cooled engine of the vertical shaft type including a radiator and a row of left and right side cylinders arranged in the V-shape as viewed from the above, wherein cooling water jackets of each of said left and right side cylinders are connected to each other at the highest end of cooling water jackets at the sides of cylinder heads of each of said

cylinders through a communicating passage, while a thermostat chamber is provided at the highest end of one of said cooling water jackets in said cylinder heads which is located



lower than the other cylinder head, said communicating passage being at its one end connected to said thermostat chamber.

4,681,068

BLOW-BY GAS PROCESSING ARRANGEMENT FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINES

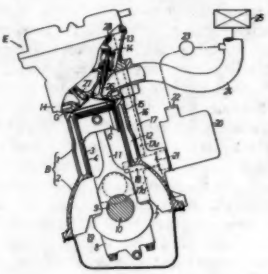
Nobuo Anno, and Takeo Arai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 807,993

Claims priority, application Japan, Dec. 14, 1984, 59-263896

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—41.86 **8 Claims**



1. A blow-by gas processing arrangement for an internal combustion engine, comprising:

a cylinder block having a chamber for collecting a blow-by gas, a blow-by gas passage communicating with said chamber, and a plurality of spaced journal walls for supporting a crankshaft;

a relatively large oil mist separating passage defined in said cylinder block and laterally extending into one of said journal walls beyond said blow-by gas passage, said oil mist separating passage communicating with said blow-by gas passage for preliminarily separating an oil mist from the blow-by gas supplied from said chamber;

an oil separator communicating with said oil mist separating passage for separating an oil mist from the blow-by gas supplied from said oil mist separating passage; and a PCV valve connected to said oil mist separator; and an intake manifold connected to said PCV valve.

4,681,069

OVERHEAD CAMSHAFT ENGINE

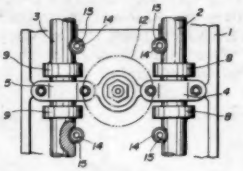
Masayuki Honma, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 18, 1985, Ser. No. 777,426

Claims priority, application Japan, Sep. 21, 1984, 59-198137

Int. Cl.[4] F01L *1/46*

U.S. Cl. 123—90.27 **5 Claims**



1. An overhead camshaft engine comprising:

a cylinder block;

a cylinder head;

a fastening member for fastening said cylinder head to said cylinder block;

a valve reciprocally mounted in said cylinder head; and

a camshaft rotatably mounted over said cylinder head to control reciprocation of said valve;

said camshaft being so arranged, with respect to a plan view, as to lap in part over said fastening member and formed with a peripheral cut at a portion where it laps over said fastening member to facilitate insertion and removal of said fastening member.

4,681,070

SUCTION GAS HEATER CONTROL DEVICE FOR ENGINES

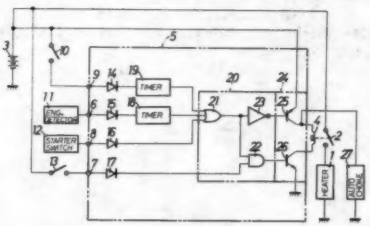
Norimitsu Kurihara, Wako; Masaaki Ozaki, Utsunomiya; Hiroshi Goto, Asaka, and Masahiko Asakura, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,327

Claims priority, application Japan, May 28, 1984, 59-107940; May 28, 1984, 59-107941

Int. Cl.[4] F02M *31/12*

U.S. Cl. 123—179 H **5 Claims**



1. A suction gas heater control device for an engine comprising first detector means for detecting when the engine has attained a complete firing, and for providing a signal in response thereto; a first timer means coupled to an output of said first detector means for continuously providing, upon receipt of said signal, a first operating signal for a period of time which starts with the beginning of inputting of said signal from the first detector means and ends after a first predetermined period of time has elapsed from the stopping of inputting of said signal; second detector means for detecting engine temperature and for providing a second operating signal when the engine

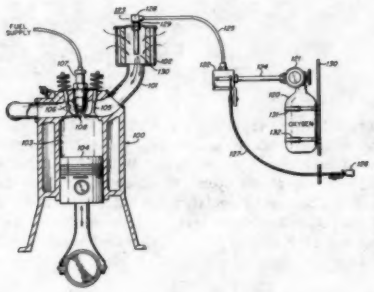
temperature is lower than a predetermined level; and a judgement circuit means coupled to said first timer means and said second detector means for providing a signal for operating a suction gas heater when the first and second operating signals are applied thereto.

4,681,071

METHOD AND APPARATUS FOR STARTING A DIESEL ENGINE AT A SUBFREEZING TEMPERATURE

Robert J. Smith, 6N091 Denker Rd., St. Charles, Ill. 60174

Filed Dec. 5, 1985, Ser. No. 805,511
Int. Cl.[4] F02N *17/08*
U.S. Cl. 123—180 R **22 Claims**



1. Method of starting a glow-plug assisted diesel engine at a subfreezing temperature, said diesel engine having an intake manifold, comprising the steps of:

delivering a flow of concentrated oxygen at a predetermined rate and a predetermined pressure to said intake manifold; and

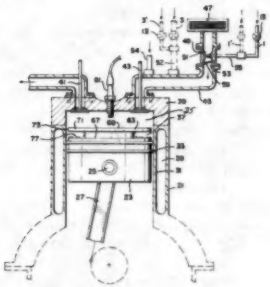
directing said concentrated oxygen flow directly into said intake manifold to fill said manifold with a predetermined amount of oxygen higher than the amount of oxygen in air available to said diesel engine for drawing said predetermined amount of oxygen into said diesel engine during an intake stroke of said diesel engine.

4,681,072

METHOD AND APPARATUS FOR DISPOSAL OF TOXIC WASTES BY COMBUSTION

Andrew A. Pouring, Edgewater, Md., assignor to Sonex Research, Inc., Annapolis, Md.

Filed Nov. 25, 1985, Ser. No. 802,189
Int. Cl.[4] F02B *23/00*
U.S. Cl. 123—193 P **13 Claims**



1. A method for disposing of halogenated hydrocarbon compounds in a piston type internal combustion engine which comprises:

(a) introducing a mixture comprised of at least one halogenated hydrocarbon compound and a sufficient amount of air to provide an oxidizable vapor phase mixture into a combustion chamber of a piston type internal combustion engine, said combustion chamber having a variable volume primary chamber and a fixed volume secondary chamber, said fixed volume secondary chamber communicating with said variable volume primary chamber through a passageway therebetween and said fixed volume secondary chamber containing a source of carbon therein;

(b) compressing and heating said vapor phase mixture by reducing the volume of said variable volume primary chamber;

(c) igniting and burning the vapor phase mixture in said combustion chamber; and

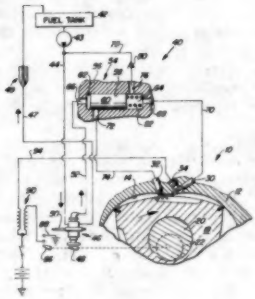
(d) discharging the combustion reaction products from said combustion chamber.

4,681,073

FUEL INJECTION CONTROL VALVE

Bernard B. Poore, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 5, 1986, Ser. No. 826,458
Int. Cl.[4] F02B *53/10*; F02M *45/02*
U.S. Cl. 123—206 **2 Claims**



1. In a rotary combustion engine having first and second fuel injection nozzles, a fuel supply system comprising:

a fuel tank;

a supply pump with an inlet communicating with the fuel tank;

an engine driven fuel injector pump; and

a fuel supply valve comprising:

a housing defining a valve bore therein, a first inlet communicating the valve bore with the injector pump, a second inlet communicating the valve bore with the supply pump, a first outlet communicating the valve bore with the first nozzle and a second outlet communicating the valve bore with the second nozzle; and

a valve member movable in the valve bore and cooperating with a wall of the bore to define a first chamber communicated with the first outlet and a second chamber communicated with the second outlet, the valve member being movable in response to fluid pressure in the first chamber from a first position wherein communication between the first inlet and first outlet is closed to a second position wherein communication between the first inlet and first outlet is open, the valve member forcing fuel from the second chamber to the second nozzle via the second outlet as it moves from its first to its second position, the first inlet and the second outlet extending axially from opposite ends of the valve bore, and the first outlet and the second

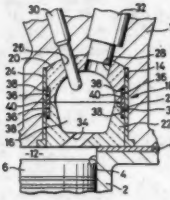
inlet extending radially in the valve housing; and a resilient member biased to urge the valve member to its first position.

4,681,074

STRUCTURE OF DIVIDED COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Yutaka Ogawa; Takayuki Ogasawara, and Shigeru Hanzawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 20, 1986, Ser. No. 876,419
Claims priority, application Japan, Jun. 24, 1985, 60-95515[U]
Int. Cl.[4] F02B 19/16
U.S. Cl. 123—271 21 Claims



1. A structure defining a divided combustion chamber of an internal combustion engine, comprising an upper ceramic member, and a lower ceramic member having a transfer passage which communicates with a main combustion chamber of the engine, said upper and lower ceramic members meeting with each other at an interface to form therein said divided combustion chamber such that the divided combustion chamber communicates with said main combustion chamber through said transfer passage, wherein the improvement comprises:

said upper and lower ceramic members having cutouts formed respectively in outer surfaces thereof, said cutouts cooperating to constitute at least one external recess which extends across said interface so as to bridge adjacent portions of said upper and lower ceramic members;

an expansion member fitted in each of said at least one external recess, and formed of a heat resistant material which has a larger coefficient of thermal expansion than said upper and lower ceramic members, said expansion member thermally expanding relative to said upper and lower ceramic members at an operating temperature of said engine, and thereby keeping said upper and lower ceramic members in spaced-apart relation with each other, with a predetermined amount of air gap at said interface during an operation of said engine.

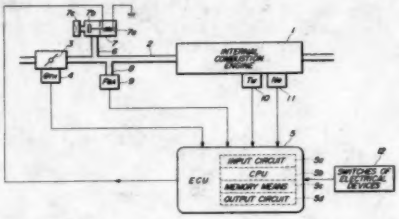
4,681,075

IDLING SPEED FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Akihiro Yamato, Shiki; Yuzuru Koike, and Kyozo Futs, both of Utsunomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,749
Claims priority, application Japan, Oct. 15, 1984, 59-214216
Int. Cl.[4] F02D 41/16
U.S. Cl. 123—339 12 Claims

1. A method of controlling the operating amount of a control valve for regulating the quantity of supplementary air being supplied to an internal combustion engine, in a feedback manner responsive to the difference between a desired idling speed and an actual engine speed, while said engine is in a predetermined idling region, said engine having an intake passage, a throttle valve arranged in said intake passage, and an air passage having one end communicating with said intake passage at a location downstream of said throttle valve and another end with the atmosphere, respectively, said control valve being arranged in said air passage, said supplementary air being supplied to said engine through said air passage and said intake passage, the method comprising the steps of: (a) detecting a temperature of said engine; (b) detecting the decreasing rate of the rotational speed of said engine when said engine is decelerating with said throttle valve fully closed in a predetermined decelerating region immediately preceding said predetermined idling region; (c) correcting a basic value of the operating amount of said control valve based upon the detected temperature of said engine and the detected decreasing rate of the rotational speed of said engine; and (d) starting the feedback control by applying said basic value of the operating amount of said control valve thus corrected as an initial value thereof, when said engine is further decelerated into said predetermined idling region.

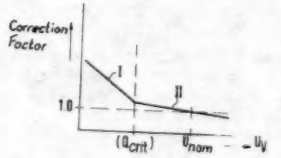


4,681,076

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hans-Martin Müller, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 809,012
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445414
Int. Cl.[4] F02D 41/04
U.S. Cl. 123—488 5 Claims



1. An electronically controlled fuel injection system for an internal combustion engine comprising:

at least one solenoid valve for metering fuel to the engine;

an electrically-operated fuel pump for pumping fuel to said solenoid valve;

supply voltage means for supplying a supply voltage to said solenoid valve and said fuel pump;

signal generating means for generating fuel injection signals in dependence upon operating characteristic quantities such as load and rotational speed, said fuel injection signals being determinative of the duration of injection;

said signal generating means including means for effecting a correction of said fuel injection signals with reference to the dependency of said solenoid valve on said supply voltage;

a pressure regulator for regulating the pressure of the fuel pumped by said pump to said solenoid valve when said pressure is above a predetermined value; and,

said signal generating means further including means for

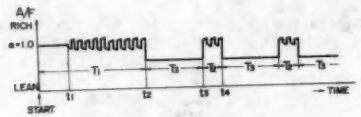
generating a correction signal related to the quantity of fuel pumped by said fuel pump with respect to the supply voltage, the reaction of said pressure regulator when the pressure of said fuel drops below said predetermined value, and the pressure of the fuel at said solenoid valve as a further correction of said fuel injection signals as a function of said supply voltage so as to adjust said duration of injection to ensure that the quantity of fuel metered to the engine is adequate to maintain the required amount of fuel according to said operating characteristic quantities.

4,681,077

AIR-FUEL RATIO CONTROLLING METHOD AND APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Haruhiko Kobayashi, Ibaraki, and Tadahiko Otani, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,572
Claims priority, application Japan, Jan. 20, 1984, 59-7202
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 **2 Claims**



1. In a method of controlling an air-fuel ratio for an engine having a plurality of first sensors for detecting an operating condition of the engine; a second sensor for detecting a condition of exhaust gas produced by the combustion of the fuel in a combustion chamber; arithmetic means for determining a control value for attaining a desired air-fuel ratio of a fuel-air mixture to be supplied to the combustion chamber of the basis of the outputs of the first sensors and the second sensor; a drive circuit for producing a control signal in response to the output of the arithmetic means; and air-fuel ratio control means for controlling an air-fuel ratio of the mixture in accordance with the output of the drive circuit;

said method comprising:

a first step of detecting the outputs of said first and second sensors;

a second step for determining a first control value for attaining such a first air-fuel ratio of the mixture that assures a desired air-fuel ratio in said combustion chamber, based on the outputs of said first and second sensors, and for applying data representing the determined first control value to said drive circuit;

a third step for determining a second control value for attaining a second air-fuel ratio of the mixture which is lean by a predetermined ratio than the first air-fuel ratio, and for applying data representing the second control value to said drive circuit, wherein said second step and third step are executed alternately in a manner that said first and second steps are repeated for a first predetermined period and thereafter said first and third steps are repeated for a second predetermined period;

wherein said arithmetic means determines a fuel injection period for one suction stroke of the combustion chamber as said first control value on the basis of said first and second sensors, said air-fuel ratio control means is fuel injection valve means for injecting fuel for the fuel injection period represented by the output of said drive circuit in response thereto, said second sensor is a λ sensor, said second step determines such a first basic fuel injection period on the basis of the output of said second sensor that assures a stoichiometric air-fuel ratio of the mixture in the combustion chamber, and corrects the first basic fuel injection period on the basis of the outputs of said second sensors, and apply data representing the corrected first basic fuel injection period as the first control value to said drive circuit, and said third step determines such a second basis fuel injection period on the basis of the outputs of said first sensors that assures an air-fuel ratio of the mixture to be lean by said predetermined ratio than said first air-fuel ratio, and corrects the second basis fuel injection period on the basis of output of said first sensors, and apply data representing the corrected second basic fuel injection period as the second control value to said drive circuit, said first predetermined period being shorter than said second predetermined period;

wherein said third step determines an average value of the first basic fuel injection periods obtained in said second steps performed in said first predetermined ratio; and

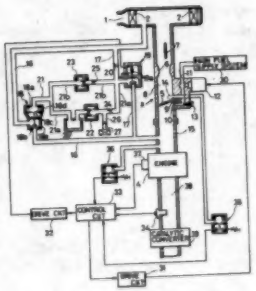
wherein only said first and second steps are performed until a predetermined time elapses after the start of the engine, after the warming up operation of the engine ends.

4,681,078

AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kunio Noguchi, Wako; Atsushi Totsune, Hoya; Koji Kajita, Niiza, and Takefumi Hosaka, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,735
Claims priority, application Japan, May 25, 1984, 59-106216
Int. Cl.[4] F02M *7/00*
U.S. Cl. 123—490 **2 Claims**

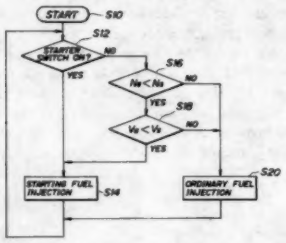


1. An air-fuel ratio control system which is operative to control the air intake side secondary air supply for an internal combustion engine having a fuel supply system including a carburetor with a slow speed fuel supply circuit which opens into an intake passage at a position near a throttle valve in the engine when said throttle valve is substantially fully closed, said control system including a feedback control means in which air intake side secondary air is supplied to the carburetor, on the downstream side of the throttle valve, in response to a result of a detection of an air-fuel ratio by means of an oxygen concentration sensor which senses the oxygen concentration of an exhaust gas of the engine, said control system further including control means for actuating said feedback control means to perform an air-fuel ratio control of air intake side secondary air supply and for substantially eliminating the operation of said slow speed fuel supply circuit of the fuel supply system in response to the result of the detection of the air-fuel ratio, under a high load operating condition of the engine in which the magnitude of the vacuum in said intake passage on the downstream side of the throttle valve is low.

4,681,079
METHOD OF CONTROLLING FUEL INJECTION

Keisuke Kaneta, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 23, 1985, Ser. No. 812,153
Claims priority, application Japan, Jan. 25, 1985, 60-11095
Int. Cl.[4] F02D *41/06*
U.S. Cl. 123—491 3 Claims



1. A method of fuel injection control for an internal combustion engine in a vehicle, comprising the steps of:

performing starting fuel injection during starting of the engine; and

thereafter monitoring the rotating speed of the engine and the velocity of the vehicle, and:

A. performing starting fuel injection when the engine speed is less than predetermined speed and the vehicle velocity is simultaneously less than a first predetermined velocity, and then continuing to perform starting fuel injection so long as the engine speed is less than said predetermined speed and said vehicle velocity is simultaneously less than a second predetermined velocity slightly greater than said first predetermined velocity;

B. performing fuel injection in an ordinary manner whenever the engine speed is greater than or equal to said predetermined speed; and

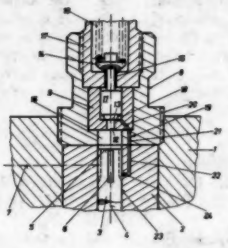
C. performing fuel injection in an ordinary manner when the vehicle velocity is greater than or equal to said second predetermined velocity, and then continuing to perform fuel injection in an ordinary manner so long as the vehicle velocity is greater than or equal to said first predetermined velocity.

4,681,080
DEVICE FOR THE TEMPORARY INTERRUPTION OF THE PRESSURE BUILD-UP IN A FUEL INJECTION PUMP

Bruno Schukoff, Graz, Austria, assignor to A V L Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbh Prof. Dr.Dr. h.c. Hans List, Graz, Austria

Filed Nov. 21, 1985, Ser. No. 800,405
Claims priority, application Austria, Nov. 23, 1984, 3721/84
Int. Cl.[4] F02M *45/10*
U.S. Cl. 123—506 2 Claims

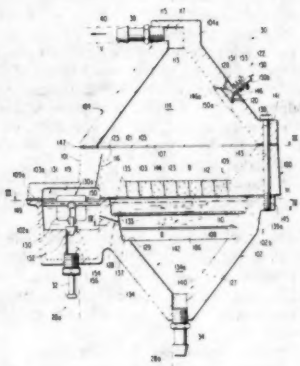
1. A device for the temporary interruption of the pressure build-up in a fuel injection pump for internal combustion engines, said pump comprising a pump plunger, a cylinder wall and a hollow guiding part having a wall at one end defining a pressure chamber together with said plunger and said cylinder wall, said guiding part wall having an inlet port in communication with said pressure chamber, a stop at an opposite end of said guiding part, a pressure relief body received within said guiding part for limited sliding movement between said stop and said guiding part wall, a spring acting against said body for imparting a pre-loading force to said body against the pressure of the fuel entering from said pressure chamber through said inlet port, said body having a reduced end at said one end of said guiding part, said reduced end defining an expansion space together with said guiding part which is accessible after a given pressure level is reached, a separate by-pass line in said guiding part leading from said expansion space for depressurizing said space, a by-pass opening in said cylinder wall leading from said by-pass line, said by-pass opening being intermittently covered by said plunger, and said plunger having control edges cooperating with said by-pass opening which is left open by said edges in an injection-free phase.



4,681,081
SPLIT VAPOR/LIQUID FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Theodore T. LaPan, 2687 Kings Mill Dr., P.O. Box 792, Marion, Ohio 43302

Filed May 6, 1986, Ser. No. 860,388
Int. Cl.[4] F02M *17/22*
U.S. Cl. 123—522 11 Claims



1. A split vapor/liquid fuel supply system for an internal combustion engine having: an intake manifold leading to at least one combustion chamber, a fuel tank holding a liquid hydrocrabon fuel supply, a carburetor connected to the fuel supply for feeding fuel to the engine, air supply means for supplying engine intake air to the carburetor for mixing with the fuel, the improvement comprising: a partial fuel vaporizer connected intermediate of the fuel tank and the carburetor, the partial fuel vaporizer including a housing defining a lower liquid fuel chamber, an upper vapor expansion chamber and a heat transfer plate separating said chambers and having small diameter holes therethrough, means for maintaining liquid hydrocarbon fuel within said liquid fuel chamber at a level beneath said perforated heat transfer plate, means for permitting ambient air to enter said liquid fuel chamber beneath the level of said liquid fuel therein for percolation therethrough, means connecting the vapor expansion chamber to the air supply means of the carburetor, upstream of the carburetor

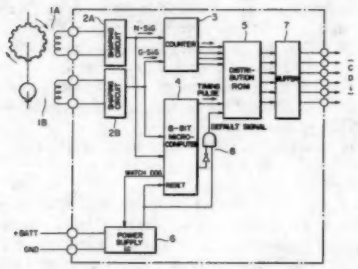
whereby light hydrocarbon fuel components in vapor form are created by vacuum pressure within the vapor expansion chamber causing air to enter the liquid fuel chamber and percolate therethrough and to expand bubbles of air passing through the heat transfer plate bearing fuel in vapor form for mixing with the main intake air stream prior to its passage through the carburetor to provide an increased time factor of air/fuel mixing with the result being less liquid fuel needed by the engine, an inrease in the speed of the flame front within the combustion chamber, an increase in portions of the fuel burned during the power stroke of the engine and less fuel waste during the engine exhaust stroke.

4,681,082

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Nobuyoshi Onogi, and Mamoru Shimamoto, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 24, 1985, Ser. No. 726,464
Claims priority, application Japan, May 2, 1984, 59-88891
Int. Cl.[4] F02P 1/00
U.S. Cl. 123—643 **3 Claims**



1. An ignition control system for an internal combustion engine, comprising:

means for detecting engine operating conditions to produce operating condition signals indicative thereof at predetermined intervals of engine crank angle;

means for computing engine ignition timing in response to the operating condition signals to produce an ignition timing deciding sinal;

means for selectively distributing an ignition timing signal to engine cylinders in response to the operating condition signals and the ignition timing deciding signal, including counter means for counting the predetermined interval signals to produce count output signals, and read-only memory means, having address input terminals and output terminals, for: (1) receiving the count output signals and the ignition timing deciding signal, (2) having data present at locations therein corresponding to the signals, (3) reading out a cylinder data corresponding to the received count output signal, and (4) distributing the ignition timing signal through one of the output terminals thereof to a corresponding one of the cylinders, which one cylinder corresponds to the read out cylinder data;

reference position sensor means for generating a reference position signal at a specific angular position per every two revolutions of the engine; and

angular position sensor means for generating angular signals, equal in number to an integral multiple of a number of the cylinders, per every two revolutions of the engine, wherein said counter means is cleared by said reference position signal to count angular signals of said angular position sensor means

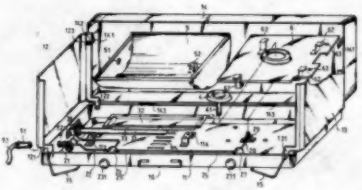
wherein said read-only memory means includes data which produces the ignition timing signal through one of the output terminals for the distribution to the corresponding cylinder in response to the ignition timing deciding signal for said computing means, and includes data which stops the produced ignition timing signal after a given number of the counting operations of said counter means.

4,681,083

PORTABLE COOKING, TOASTING, ROASTING, AND CARBONADO HEATING DEVICE

Brandon Shu, Taipei, Taiwan, assignor to High Brandon Incorporated, Taipei, Taiwan

Filed Jul. 7, 1986, Ser. No. 882,395
Int. Cl.[4] F24C 1/16
U.S. Cl. 126—9 R **1 Claim**



1. A portable device for cooking, toasting, roasting, and carbonado heating, comprising:

an oven body having a bottom wall, two opposing side walls, a front wall, and a back wall, said bottom wall having a plurality of vent holes therethrough;

an intake duct connected into one of the side walls of the oven body;

a three-way throttle control valve means installed in the front wall of the oven body;

a fuel guide duct connected between the intake duct and the control valve means;

a mixing valve fixed into one of the side walls of the oven body;

a first pipe extending from the control valve means to the mixing valve;

a first burner secured to the bottom wall of the oven body;

a second pipe extending from the control valve means to the burner;

a relatively flat facing plate provided around the burner;

a semicylindrical toasting tank fitted to the bottom wall of the oven body and having top edges;

a tubular burner secured at one end to the mixing valve and extending into the toasting tank;

a pan fitted inside the toasting tank and extending over the tubular burner;

a grill centrally sunk in the toasting tank and resting on the top edges of said toasting tank;

an oblong gridwork extending over both the grill and the facing plate;

two siding plates arranged above the two opposing side walls of the oven body;

a cover hinged to the back wall of the oven body;

fastener means, secured to both the two siding plates and the cover, for retaining the siding plates and the cover in a joined upstanding position;

a handle means, fixed to the front wall of the oven body, for carrying the portable device; and

snap fastener means, secured in and extending from the front wall to the back wall of the oven body, for serving as legs for the portable device in an open condition when the two siding plates and the cover are in the upstanding position and and for serving as securement means for retaining the portable device in a closed condition when the two siding plates and the cover are collapsed out of their upstanding position.

4,681,084

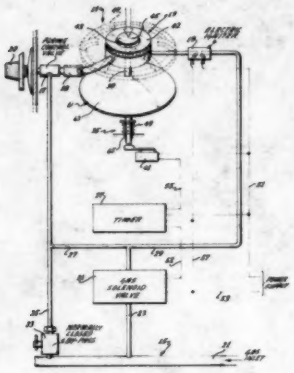
BURNER CONTROL SYSTEM

Leonard Grech, Capistrano Beach, Calif., assignor to George Catsouras, Laguna Niguel, Calif., a part interest

Continuation-in-part of Ser. No. 738,253, May 28, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,073

Int. Cl.[4] F24C *3/12*

U.S. Cl. 126—52 **18 Claims**



1. A burner control system for use with a gas stove having at least one burner and a gas supply conduit for supplying gas to the burner, said burner control system comprising:

a solenoid valve in said conduit for controlling the main flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a second position in which it reduces gas flow therethrough the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

said sensing means including a switch having first and second states for providing said first and second signals, respectively, and an actuator rod extending between the burner and the switch, said switch being normally in said second state and said actuator rod being engageable and movable by a utensil on the burner to move said switch to said first state to provide said first signal;

circuit means responsive to the first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the second position whereby gas flow through the solenoid valve to the burner is reduced;

said switch being below said burner;

a shield mounted on the actuator rod for movement therewith and interposed between the switch and the burner; and

mounting means located entirely beneath said shield and slidably cooperating with the actuator rod for mounting the actuator rod for movement.

9. A burner control system for use with a gas stove having at least one burner and a gas supply conduit for supplying gas to the burner, said burner control system comprising:

a solenoid valve in said conduit for controlling the main flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a second position in which it reduces gas flow therethrough the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

said sensing means including a switch having first and second states for providing said first and second signals, respectively, and an actuator rod extending between the burner and the switch, said switch being normally in said second state and said actuator rod being engageable and movable by a utensil on the burner to move said switch to said first state to provide said first signal;

circuit means responsive to the first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the second position whereby gas flow through the solenoid valve to the burner is reduced;

said switch being below said burner;

a shield assembly including a first shield interposed between the burner and the switch for shielding the switch from the burner;

said actuator rod extending through said first shield and being movable with respect to the first shield to move said switch; and

said shield assembly including a second shield interposed between the burner and the first shield for shielding regions of the actuator rod and the first shield.

13. A gas stove comprising:

at least one burner;

a gas supply conduit for supplying gas to the burner;

a manually operable gas valve for controlling the flow of gas through the supply conduit to the burner;

a solenoid valve for controlling the flow of gas to the burner, said solenoid valve having an open position in which it permits gas flow therethrough to the burner and a closed position in which it substantially prevents gas flow therethrough to the burner;

sensing means for providing a first signal when a utensil is on the burner and a second signal when no utensil is on the burner;

circuit means responsive to said first signal to move the solenoid valve to the open position whereby gas can be supplied to the burner and responsive to said second signal to move the solenoid valve to the closed position whereby gas flow through the solenoid valve to the burner is substantially prevented; and

time delay means responsive to said second signal for moving the solenoid valve to said closed position a predetermined time after the utensil is removed from the burner.

4,681,085

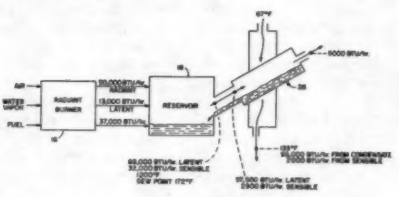
HIGH CONDENSING RECUPERATIVE FURNACE

Lawrence G. Clawson, Dover, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 761,636, Aug. 1, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,260

Int. Cl.[4] F24H *3/02*

U.S. Cl. 126—110 R **3 Claims**



1. A method for heating fluid in a furnace comprising the steps of:

(a) providing a recuperative heat exhanger having at least one conduit which is generally continuously upwardly directed fromm an inlet end to an outlet end;

(b) locating a burner proximate said inlet end for introducing hot combustion gases into said inlet;

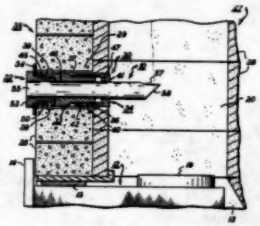
(c) locating reservoir means under said inlet and adjacent said burner;
(d) probiding means for contacting said heat exchanger with a fluid to be heated;
(e) operating said contacting means; and
(f) operating said burner at a given heat output level where said fluid cools said hot combustion products such that a substantial majority of the water vapor in said combustion products condenses within said heat exchanger, wherein a steady state cycle of condensation and evaporization is maintained where condensate flows back downward said at least one conduit into said reservoir at the same said heat output from said burner re-evaporates condensate in said reservoir means and in said at least one conduit for subsequent condensing in said at least one conduit.

4,681,086

VIEWING INSTRUMENT FOR CHIMNEY

Frederic D. Van Patten, RD 1, Stock Rd., Hannibal, N.Y. 13074

Division of Ser. No. 747,870, Jun. 24, 1985, Pat. No. 4,612,508.
This application Jun. 2, 1986, Ser. No. 869,330
Int. Cl.[4] F24B *1/18*
U.S. Cl. 126—120 **8 Claims**



1. Apparatus for visually monitoring the vent of a chimney while the chimney is drawing exhaust gases through a flue entrance that includes

a hollow barrel unit sealed within a horizontal receiving opening passing through a wall of the chimney above the flue entrance, said barrel unit further having an adjusting means for changing the axial length of the unit whereby the barrel unit can be fitted to the chimney wall,

mounting means removably joined to the outer end of said barrel unit to provide an airtight seal therebetween,

an elongated quartz rod contained within the mounting means that passes through the barrel unit into the chimney vent,

said rod having an upper light entrance face horizontally disposed at the free end thereof for receiving light from the chimney vent, a reflecting surface immediately below the light entrance face for directing entering light axially along the rod and a light exit face perpendicular to the axis of the rod which is located outside the chimney.

4,681,087

WOODKILN COMBUSTION DEVICE

John G. Meeker, Deans Bridge Rd., Somers, N.Y. 10589

Filed May 1, 1986, Ser. No. 858,419
Int. Cl.[4] F24C *15/30*
U.S. Cl. 126—126 **17 Claims**

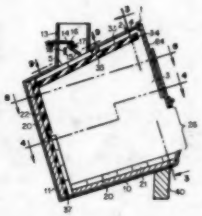
1. A wood burning device comprising:

(a) top, back, side and bottom members and front edge members connected together to define a box and a combustion chamber therein, having an open front and said bottom member providing means for supporting fuel to be burned in the combustion chamber;

(b) ceramic glass front connected to the front edge members, said front having

(1) an upper part fixed to the front edge member to close the top front of the box, and

(2) a lower part mounted for sliding movement between a closed position closing the bottom front of the box to one or more open positions overlying the upper part to provide an access opening in the lower front of the box



(c) means for supporting the box with the front facing upwardly at an acute angle to the horizontal;

(d) an air induction means for supplying air into said combustion chamber and associated with one of said members; and

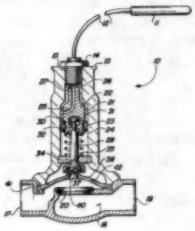
(e) an exhaust opening on the top member of the box for exhausting the interior of the combustion chamber.

4,681,088

FREEZE PROTECTION VALVE FOR SOLAR HEATERS

Charles J. Cromer, 460 Indian Creek Dr., Cocoa Beach, Fla. 32931

Filed Mar. 24, 1986, Ser. No. 843,206
Int. Cl.[4] F24J *2/40*; F16K *31/44*
U.S. Cl. 126—420 **3 Claims**



1. A solar heater freeze protection valve apparatus comprising in combination:

a valve housing;

a remote sensor operatively connected to the valve housing from a remote position, the remote sensor including a bulb containing a liquid adapted to compress and expand with the temperature adjacent the bulb;

a piston located in the valve body and slidable therein responsive to expansion and contraction of the liquid in the remote sensor;

a first valve element located in the valve housing and attached to the valve piston for movement therewith;

a second valve element located in the valve housing and attached to the housing;

a first valve seat in said second valve element forming an opening therethrough;

a second valve seat positioned in a water passageway to allow the flow of fluid therethrough when the second valve element is in an open position and to cut off the flow of fluid therethrough when the second valve element is in a closed position, whereby liquid in a solar heater can flow at predetermined temperature readings; and

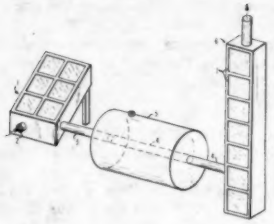
said second valve element being biased in one direction and having a second opening therethrough to increase the pressure therebehind when said first valve element closes on the first valve seat and the second valve element closes on the second valve seat.

4,681,089

CONVECTION POWERED SOLAR HEATER FOR WATER TANKS

Louis R. O'Hare, 7425 N. Mona Lisa Rd. #156, Tucson, Ariz. 85741

Filed Apr. 6, 1981, Ser. No. 250,943
Int. Cl.[4] F23J 3/02
U.S. Cl. 126—434 9 Claims



1. A passive solar water tank heater comprising:

(1) a solar air heater in the form of a black box solar collector having an inlet port to receive ambient air as well as exit ducting by which it is placed in fluid flow communication with

(2) a heat exchanging means in the form of a pipe extending through water in a water tank thereby conducting to the water heat from air circulating in the pipe, which air is being drawn through said heat exchanging means by an energetic draft from

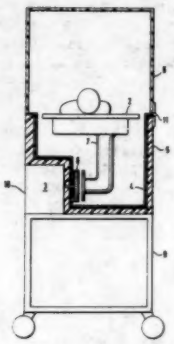
(3) a draft production means comprising a solar heated black box collector in the form of a column having an air exit port on top and an air inlet duct on the bottom, with said top port being so elevated in height over the lower inlet duct as to cause to form within said collector a column of upward convecting air and thereby to produce a low pressure area within at its base, and said draft producing means both of such a vertical length as to provide an air column sufficiently long and energetic as to produce a draft at its base sufficient to draw even hot air some distance downward and of sufficient energy as to be capable of drawing a current of air through the heat exchanging means from the solar air heater means to thereby provide an open cycle air circulation in which the heat exchanging means is intermediate in a serial series fluid flow communication between the solar air heater and the draft production means and in which the heated air heated in the solar air heater is drawn into thermal communication with the heat exchanging means to heat the water and in which said draft production means, in the form of a black box collector, is a long rectangular black box collector disposed with its length extending vertically in such a manner that air entering the inlet duct at its base is heated by solar energy and rises upward in a convection column to exit through the exit port on the top.

4,681,090

INCUBATOR FOR PREMATURES AND NEWBORNS

Joachim Koch, Hollenbek, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,328
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503418
Int. Cl.[4] A61G 11/00
U.S. Cl. 128—1 B 3 Claims



1. An incubator for premature and newborn infants comprising:

a base wall and mutually adjacent side walls extending upwardly from said base wall;

a transparent hood mounted on said side walls to conjointly define a compartment with said base wall and said side walls for accommodating the infant therein;

at least a portion of said base wall being configured to define an enclosure outside of said compartment;

conditioning means mounted in said enclosure for conditioning the air supplied to said compartment;

a removable insert liner complimentally configured to the inside surface of said base wall and said side walls and extending over the surface of said walls inside of said compartment so as to separate said walls and said enclosure from the air within said compartment; and,

a support for the infant removably mounted in said housing so as to facilitate removal of said insert liner.

4,681,091

COMBINATION MODALITY CANCER THERAPY

Donald H. Picker, 310 Woodside Ave., Narberth, Pa. 19380, and Paul C. Hydes, 13 Woodlands Grove, Caversham, Reading, Berkshire, RG4 ONB, United Kingdom

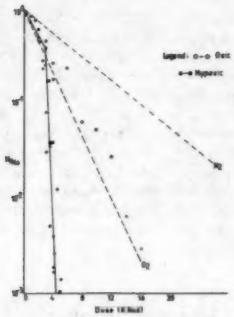
Continuation-in-part of Ser. No. 637,556, Aug. 3, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,232
Int. Cl.[4] A61B 19/00
U.S. Cl. 128—1 R 4 Claims

1. A pharmaceutical composition comprising an effective amount of a coordination compound having the general empirical formula

$$[Rh^{III}X_xY_y]^a$$

in which X is at least one anionic ligand, Y is at least one neutral ligand, with the proviso that at least one of X and Y is a nitrogen donor ligand, x is an integer from 1 to 6, y is an

integer from 1 to 5 or may be equal to zero, and a is a positive or negative integer from −3 to +3 or may be equal to zero, in



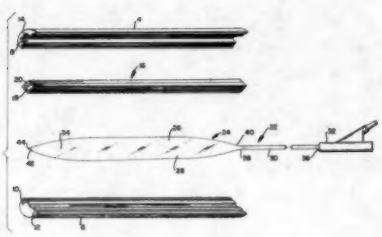
association with a pharmaceutically-acceptable carrier, diluent or excipient therefor.

4,681,092

BALLOON CATHETER WRAPPING APPARATUS

George E. S. Cho, Natick, and Stephen B. Kessler, Gloucester, both of Mass., assignors to Kontron Inc., Everett, Mass.

Filed May 21, 1985, Ser. No. 736,598
Int. Cl.[4] A61B *19/00*; A61M *25/00*
U.S. Cl. 128—1 D **36 Claims**



1. An apparatus for wrapping a balloon catheter having a balloon membrane attached to a catheter tube comprising:

(a) a housing having a channel to receive at least a portion of the balloon membrane of the balloon catheter; and

(b) displaceable clutching means, at least a portion of which being located and positioned in the channel and functioning as follows: (i) during wrapping, engaging and being displaced by the balloon membrane to exert predetermined pressure on the balloon membrane to aid in the wrapping of the balloon membrane as the wrapping apparatus is rotated relative to the balloon catheter yet, and (ii) after wrapping, permitting relatively free rotation of the balloon membrane within the channel.

4,681,093

ENDOSCOPE

Kimizo Ono, and Akira Nishimura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 12, 1983, Ser. No. 560,104
Claims priority, application Japan, Dec. 13, 1982, 57-188287[U]; Dec. 13, 1982, 57-188288[U]; Jan. 19, 1983, 58-7966[U]
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **17 Claims**

1. An endoscope for image-observing or measuring an area filled with an opaque liquid comprising:

an image fiber;

a lens positioned at the leading end of said image fiber;

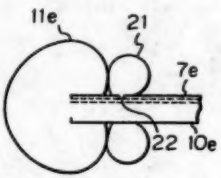
a light guide arranged in parallel to said image fiber;

a transparent fluid transport passage arranged in parallel to said image fiber and light guide and having an outlet at the leading end thereof;

a sheath enclosing said image fiber, lens, light guide and transparent fluid transport passage;

means for providing a field of vision at the leading end of said endoscope by a transparent fluid from said outlet of said transparent fluid transport passage; and

stabilizing means provided on the leading end portion of said sheath for stabilizing said field of vision formed by said field of vision providing means



said field of vision providing means including a transparent balloon provided at the leading end of said endoscope encircling said lens, the leading end of said light guide and the outlet of said transparent fluid transport passage and being inflatable by the transparent fluid from said opening;

said stabilizing means including a substantially cylindrical balloon support means formed of a resilient material and provided at the leading end of said endoscope so as to encircle the joint portion of said balloon, said balloon support means in response to inflation of said balloon, being gradually expanded in a direction from a trailing end toward a leading end thereof for supporting the balloon joint portion when said balloon is inflated.

4,681,094

BALLOON LARYNGOSCOPE

Michael A. Rolnick, Chevy Chase, Md., assignor to American Medical and Emergency Research Corporation, Chevy Chase, Md.

Filed Nov. 27, 1985, Ser. No. 802,356
Int. Cl.[4] A61B *1/26*
U.S. Cl. 128—10 **34 Claims**

1. A laryngoscope comprising a blade unit, said blade unit including a distal leading end and a proximal handling end, an elongate tubular passageway defined through said blade unit for selective reception of an endotracheal tube therethrough, said tubular passageway opening through said distal and proximal ends, said blade unit having opposed first and second longitudinal outer surfaces respectively engageable with the tongue and mouth roof of a patient, said second surface includ-

ing an inflatable positioning balloon along a portion thereof rearward from said distal end, and means for selectively inflating said balloon for outward expansion of said balloon into pressure engagement against a mouth roof thereby providing a fulcrum for movement of the first surface toward and against an opposed tongue and for simultaneous establishment of an airway and visual path to the trachea while precluding significant dental contact forces.

4,681,095

PORTABLE DEVICE FOR SKIN MASSAGE BY COLD

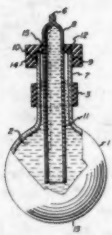
Raymond Bontemps, 5 Rue Edouard DeVaille, Paris, France

Continuation of Ser. No. 681,235, Dec. 13, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,833

Claims priority, application France, Dec. 19, 1983, 83 20273

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—24.1 **5 Claims**



1. A skin massager comprising:

a glass flask having upper and lower integral portions, said lower portion being substantially spherical and terminating in an upper portion said upper portion being cylindrical; said flask being substantially completely filled with a liquid capable of being maintained as a liquid at −20° C.;

an annular insulating collar coaxially disposed about a portion of said upper portion; and

closure means including a flexible teat affixed to said upper portion;

said teat being completely filled with said liquid during use and having a soft tip for massaging the skin.

4,681,096

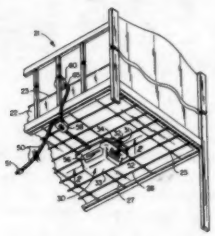
METHOD AND APPARATUS FOR THERAPEUTIC MOTION AND SOUND TREATMENT OF INFANTS

Armando A. Cuervo, 737 Autumn Branch Rd., Westerville, Ohio 43081

Continuation-in-part of Ser. No. 553,317, Nov. 18, 1983, abandoned, and a continuation-in-part of Ser. No. 712,561, Mar. 15, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,454

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—33 **11 Claims**



1. An apparatus for soothing and pacifying, specifically an infant suffering from colic, said apparatus adapted to be supported on a support means such as an infants crib, and comprising in combination:

a. means for imparting a rhythmic cyclic motion of displacement to the support means, the frequency of displacement being between about twenty-five and about forty-three cycles per second and the amplitude of the displacement between being about one hundredth and about one eighth of an inch; and

b. means for, selectively and simultaneously with the means of step a, imparting a steady and unpulsed sound within the hearing range of the infant, and means for controlling the sound range within an intensity range of between about sixty decibels and about eighty decibels within a frequency range of between about two hundred Hertz and about four thousand Hertz.

4,681,097

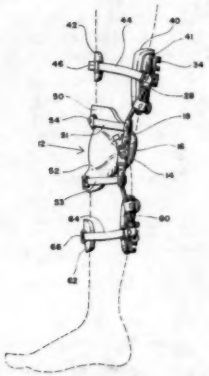
ORTHOPEDIC BRACE

Timothy T. Pansiera, 1335 NE. 28th St., Pompano Beach, Fla. 33064

Filed Jan. 23, 1986, Ser. No. 824,284

Int. Cl.[4] A61F *5/01*

U.S. Cl. 128—77 **3 Claims**



1. An orthopedic brace, comprising:

(a) a U-shaped upper frame proportioned to a posterior, proximal area of a body limb, said upper frame comprising means for selectably changing the transverse width thereof, such frame having a major axis;

(b) an upper pad position adjustment element press-fittably rotatably attachable to said transverse width changing means, in more than one position relative to the major axis of said upper frame;

(c) a proximal posterior pad support secured to said upper pad position adjustment element;

(d) a proximal posterior pad detachably attachable to said proximal posterior pad support;

(e) a proximal anterior pad;

(f) strap means for mechanically joining said anterior proximal pad and said posterior pad supports, said strap means further comprising means for adjusting the direction and pressure of said posterior pad upon the upper area of the limb of the user;

(g) a U-shaped lower frame proportioned to a posterior distal area of the limb, said lower frame comprising means for selectably changing the transverse width thereof, said frame having a major axis;

(h) a lower pad position adjustment element press-fittably rotatably attachable to said transverse width-changing

means in more than one position relative to the major axis of said lower frame;

(i) a distal posterior pad support secured to said lower pad position adjustment element;

(j) a distal posterior pad detachably attachable to said distal posterior pad support;

(k) a distal anterior pad;

(l) strap means for mechanically joining said anterior distal anterior pad and said distal pad support, said strap means further including means for adjusting the pressure of said anterior and posterior distal pads upon the lower area of the limb of the user;

(m) a hinge means for selectably changing and locking the position of said upper frame and its attendant elements relative to said lower frame and its attendant elements; and

(n) anterior joint pad and straps therefore joining said new pad to said U-shaped frames above and below said hinge means.

4,681,098

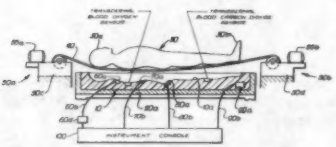
SYSTEM, APPARATUS AND METHOD FOR GATHERING PHYSIOLOGICAL DATA

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Filed Oct. 11, 1985, Ser. No. 786,746

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—630 **11 Claims**



1. A system for accurately reproducibly positioning sensors for gathering physiological data from a subject's body, the system comprising:

steady means for stationing in a reproducible position the subject's body;

sensor means affixed to the steady means for taking physiological data from contact with the subject's body; and

transfer means affixed to the steady means for transferring the subject's body into and out of stationing within the steady means, and into and out of contact with the sensor means.

4,681,099

BREATH-SYNCHRONIZED CONCENTRATED-OXYGEN SUPPLIER

Toru Sato; Naoto Okazaki, both of Yonago, and Katsumasa Fujii, Okayama, all of Japan, assignors to Tottori University, Tottori, Japan

Filed Nov. 13, 1985, Ser. No. 797,654

Claims priority, application Japan, Nov. 30, 1984, 59-253495

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.23 **4 Claims**

1. A breath-synchronized concentrated-oxygen supplier, comprising

an oxygen concentrator producing and storing oxygen-enriched gas;

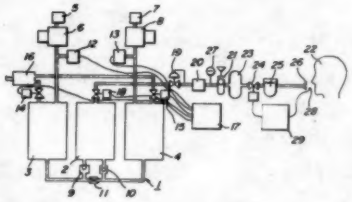
a buffer tank having an inlet connected to said oxygen concentrator and an outlet, said buffer tank temporarily storing the oxygen-enriched gas from the oxygen concentrator;

a valve mounted in said outlet of said buffer tank so as to control flow of the oxygen-enriched gas from the buffer tank, patient connection means connected to said outlet and adapted to be connected to a respiratory system of a living body and having a gas flow path that is open to the atmosphere;

sensor means for sensing the respiration of the living body and adapted to generate an output signal indicative of the inhalation phase and the exhalation phase of the respiration;

an input means on which a ratio between the entire length of the inhalation phase and a specific end portion thereof is set; and

regulator means responsive to said sensor means and input means and adapted to detect the duration of each inhalation phase in succession based on the output signal from said sensor means and to open said valve at the beginning of each inhalation phase, as well as to maintain the open time of said valve based on a period determined by a combination of averaging the preceding inhalation phase durations and said ratio set on the input means; whereby oxygen-enriched gas is supplied to said living body during each inhalation phase except said specific end portion thereof, and said buffer tank acts to make the initial flow rate of the oxygen-enriched gas higher than the steady flow rate thereof in each inhalation phase.



4,681,100

MULTINOZZLE GENERATOR FOR HIGH FREQUENCY NOZZLE VENTILATION OF LUNGS

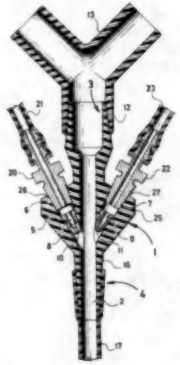
Ondrej Brychta, Trencin, and Vladimir Zabrodsky, Prague, both of Czechoslovakia, assignors to Konstruktiva Trencin, narodny podnik, Trencin, Czechoslovakia

Filed Dec. 30, 1985, Ser. No. 814,643

Claims priority, application Czechoslovakia, Dec. 28, 1984, 10492-84

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.25 **9 Claims**



1. An improved multinozzle generator for high frequency nozzle ventilation of lungs, the improvement comprising

a connecting element comprising a body with a cylindrical

bore therethrough having a nominal internal diameter and having first connection means at one end of said cylindrical bore adapted to be operatively mounted to a device used for treatment of lungs, such as a broncoscope, and second connection means at the opposite end of said cylindrical bore adapted to be mounted to a tube, such as an intubation tube, introduced into air passages of a patient,

at least two feeding inlet openings provided in said body,

nozzles with nozzle outlet openings of different internal diameter operatively mounted in said inlet openings and terminating at said cylindrical bore,

the axes of the nozzle outlet openings intersecting with the axis of the cylindrical bore at an angle ranging from 10 to 30 angular degrees.

4,681,101

ANESTHETIC DEVICE

Norton J. Bicoll, 728 Preston Forest, Dallas, Tex. 75230

Filed Aug. 20, 1985, Ser. No. 767,521

Int. Cl.[4] A61B *17/00, 17/34*

U.S. Cl. 128—303 R **2 Claims**

1. A device for temporarily anesthetizing localized regions of living tissue comprising:

(a) a first substantially flat smooth body having a first substantially circular aperture passing transversely therethrough, the largest diameter of said first aperture being approximately one millimeter and the diameter of said first body being approximately two to approximately four times the diameter of said first aperture;

(b) a first elongated shank supporting said first substantially flat smooth body;

(c) a second substantially flat smooth body having a second substantially circular aperture passing transversely therethrough, the largest diameter of said second aperture being approximately one millimeter and the diameter of said second body being approximately two to approximately four times the diameter of said second aperture;

(d) a second elongated shank supporting said second substantially flat smooth body; and

(e) an elongated handle interconnecting said first shank and said second shank with the central axis of said first aperture aligned substantially 90° from the axis of said elongated handle and the central axis of said second aperture aligned substantially parallel with the axis of said handle.

4,681,102

APPARATUS AND METHOD FOR INSERTION OF AN INTRA-OCULAR LENS

Michael T. Bartell, 2867 Mill Rd., Doylestown, Pa. 18901

Filed Sep. 11, 1985, Ser. No. 774,720

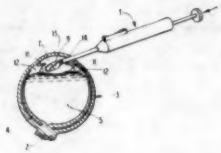
Int. Cl.[4] A61F *2/16;* A61B *17/00*

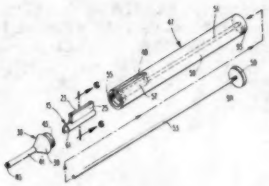
U.S. Cl. 128—303 R **36 Claims**

1. Apparatus for inserting an intra-ocular lens into an eye, comprising:

(a) a load chamber constructed of a flexible material, the load chamber having a pair of generally semi-cylindrical portions, both of the semi-cylindrical portions being connected to a flange, the load chamber being foldable, wherein the load chamber, in its folded position, defines a lumen for passage of the intra-ocular lens therethrough,

(b) an insertion cone adapted to abut the load chamber, the insertion cone having a distal end adapted for insertion into a small incision in the eye, the insertion cone having a threaded portion at its proximal end, and





(c) an injector portion, adapted to engage the threaded portion of the insertion cone, the injector portion comprising a generally cylindrical body having a central lumen therethrough, and having a slot, near its distal end, for engagement with the flanges of the folded load chamber, wherein the injector portion fits over the load chamber and onto the insertion cone, the injector portion including plunger means adapted for insertion through the lumen, the plunger means being of sufficient length to advance the lens through the load chamber, through the insertion cone, and into the eye.

4,681,103

ULTRASOUND GUIDED SURGICAL INSTRUMENT GUIDE AND METHOD

James C. Boner, Los Gatos; Mitchel S. Berger, San Francisco, and Marc Fine, Santa Rosa, all of Calif., assignors to Diasonics, Inc., Milpitas, Calif.

Filed Mar. 11, 1985, Ser. No. 710,068

Int. Cl.[4] A61B *8/12*

U.S. Cl. 128—303 B **4 Claims**

1. An ultrasound guided instrument guide comprising:

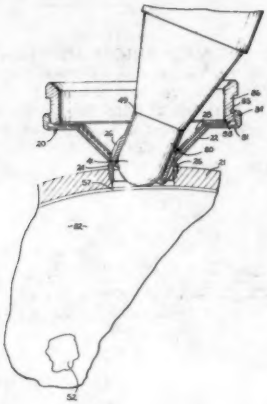
an adaptor housing having a central portion, said adaptor housing having a hole through said central portion thereof for providing access of an ultrasound probe disposed therein to a volume therebelow, said adaptor housing having a lower threaded portion for screwing said adaptor housing in a burr hole in a skull and an upper threaded portion;

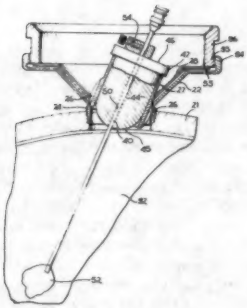
a probe socket disposed in said hole in said adaptor housing, said probe socket with passage therethrough for holding an ultrasound probe by its tip portion, said probe socket comprising a spherical member and a neck member attached thereto;

a clamp ring disposed over said probe socket;

a locking ring disposed over said clamp ring, said locking ring being threaded to mate with said upper threaded portion of said adaptor housing such that the tightening of said lock ring with respect to said adaptor housing applies

pressure to said clamp ring thereby locking said probe socket in position; and





an instrument holder formed in the shape of said ultrasound probe tip and having a hole disposed through its longitudinal axis adapted to hold said instrument therein.

4,681,104

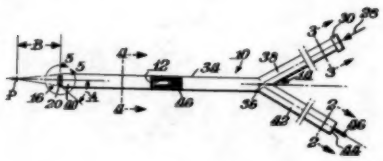
APPARATUS FOR FOCUSING AN INTRAVASCULAR LASER CATHETER

William Edelman, Seal Beach, Calif., assignor to Shiley Inc., Irvine, Calif.

Continuation of Ser. No. 582,675, Feb. 23, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,070

Int. Cl.[4] A61N *5/06*

U.S. Cl. 128—303.1 **9 Claims**



1. Apparatus for directing laser energy comprising:

a plurality of optical fibers having proximal ends adapted to receive a source of laser energy and having distal ends which transmit the laser energy;

said apparatus having a central axis and having a point on the central axis;

said distal ends of the fibers arranged into a parallel annular array about the point on the central axis;

said fibers having a surface beveled at a common angle on the distal ends thereof; and

said beveled surfaces being oriented away from the central axis and perpendicular to a plane formed by the central axis and the center of the distal end of the respective fiber, whereby the laser energy associated with the apparatus is transmitted from each fiber toward the central axis to converge substantially at a common focal point.

4,681,105

MICROSURGICAL TOOL

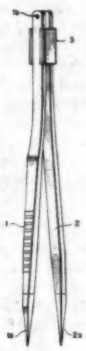
Eugen Tritt, Jestetten, Fed. Rep. of Germany, assignor to S+T Marketing AG, Neuhausen a. Rheinfall, Switzerland

Filed Apr. 18, 1983, Ser. No. 486,219

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214318

Int. Cl.[4] A61B *17/39*

U.S. Cl. 128—303.17 **8 Claims**



1. A microsurgical tool comprising:

a first metallic arm member having a first end region and a second metallic arm member having a second end region,

a metallic connection member fixing together said first arm member and said second arm member at the end regions of said first and second arm members for providing a mechanically rigid connection between said two arm members,

electrically insulating means intermediate said connection member and at least one of said arm members for electrically insulating the metallic arm members from each other,

said insulating means including at least one of said arm members being provided with an insulating covering layer circumscribing and extending at least over one of said end regions and consisting of an oxide protection coating applied to the surface of said at least one arm member by plasma coating,

said metallic connection member being in contact with at least one of said end regions of said arm members via at least said oxide protection coating, and

a pressure equalization layer between the oxide protection coating and said metallic connection member.

4,681,106

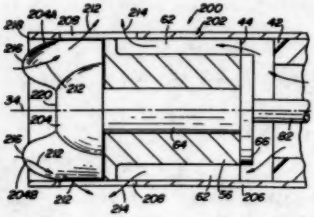
CATHETER BASED SURGICAL METHODS AND APPARATUS THEREFOR

Kenneth Kensey, Hinsdale, Ill., and John Nash, Downingtown, Pa., assignors to Intravascular Surgical Instruments, Inc., Frazer, Pa.

Division of Ser. No. 765,034, Aug. 12, 1985. This application Sep. 22, 1986, Ser. No. 909,652

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **3 Claims**



1. An in situ method of rendering valves in a section of vein inoperative by utilizing an elongated, small diameter, flexible catheter having a longitudinal axis and a distal end at which a working head is located, said working head being arranged for high speed rotary movement with respect to said axis by associated drive means, said drive means being arranged to freely effect the movement of said working head even if said catheter is bent through any arc up to a minimum radius of curvature and without resulting in excessive vibration which could interfere with said method, said method comprising inserting said catheter into said vein from a remote location, causing said drive means to rotate said working head at said high rate of speed and advancing said catheter into said vein along said axis as said working head is rotating, whereupon mechanical action of said moving working head renders said valves inoperative.

4,681,107

DEVICE FOR HOLDING AN ANEURYSM CLIP

George Kees, Jr., Alexandria, Ky., assignor to Kees Surgical Specialty Co., Wilder, Ky.

Filed Dec. 31, 1985, Ser. No. 815,388

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **5 Claims**

1. A holder for an aneurysm clip which comprises a tubular clip opening fitting, a clip holding tool, means for drawing the clip holding tool through the tubular clip opening fitting, the clip holding tool having arms engageable with the aneurysm clip to hold the aneurysm clip, portions of the arms being engageable with the clip opening fitting to cause the arms of the clip holding tool to close to clip holding position when the clip holding tool is drawn into the tubular clip opening fitting, means on the tubular clip opening fitting engageable with the aneurysm clip for causing opening of the aneurysm clip in correlation to advance of the clip holding tool along the tubular clip opening fitting and adjustable stop means for selecting the limit of advance of the clip holding tool along the clip opening fitting as corresponds to the desired opening of a selected aneurysm clip held by the clip holding tool, whereby the holder may be adapted to hold a selected aneurysm clip in a pre-selected open attitude.

4,681,108

CIRCULAR MECHANICAL ANASTOMOTIC GUN

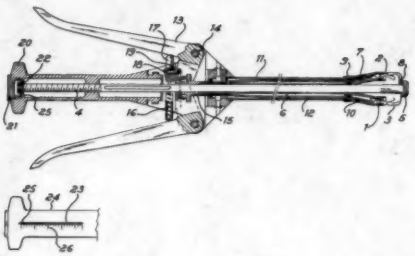
Riccardo Rosati, Via Livorno, 4, Milano, and Carlo Rebuffat, Via Galilei, 17, Trento, both of Italy

Filed Feb. 13, 1985, Ser. No. 701,150

Claims priority, application Italy, Feb. 16, 1984, 19653 A/84

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 R **4 Claims**



4. A circular mechanical anastomotic gun suitable for the insertion of a three-element device to effect compression anastomosis of hollow organs, comprising:

a central slide carrying at an end thereof blocking means for carrying an outer element of said device; three tubular bodies coaxial with the central slide, which carry at their ends a circular blade, an inner and an intermediate element of said device, respectively; means for moving driving means coaxial with the central slide, said driving means being in engagement simultaneously with the inner tubular body carrying the circular blade and the intermediate tubular body carrying the inner element of said device; means disconnecting the engagement between said driving means and the intermediate tubular body after the intermediate tubular body has moved a prescribed distance with the inner element against the intermediate element, said driving means continuing to move only the inner tubular body so that the circular blade advances, cutting the outer element circumferentially outside said blocking means.

4,681,109

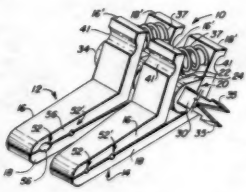
SURGICAL INSTRUMENTATION FOR BLOOD VESSELS

Juan Arroyo, 12200 SW. 93 St., Miami, Fla. 33186

Continuation-in-part of Ser. No. 791,498, Oct. 25, 1985, which is a continuation-in-part of Ser. No. 743,940, Jun. 12, 1985, Pat. No. 4,630,608. This application Jun. 19, 1986, Ser. No. 876,109

Int. Cl.[4] A61B *17/08, 17/00*

U.S. Cl. 128—335 **47 Claims**



1. A surgical instrumentation assembly of the type primarily designed for the positioning of open ends of blood vessel sec-

tions in aligned relation to one another, said assembly comprising:

(a) a clamp assembly including at least one clamp each comprising two substantially elongated arms movably secured to one another,

(b) a fulcrum structure mounted on said one clamp and disposed intermediate opposite ends of said two arms and interconnected thereto and structured to define a pivotal connection between said two arms,

(c) said one clamp structured to include a positioning means at least partially mounted on each of said two arms adjacent a first of said opposite ends thereof and structured for holding and positioning a vessel section,

(d) said positioning means of each clamp including at least one gripping structure defined by a gripping surface integrally formed on an inner surface of each arm, said gripping surfaces of each clamp disposed in aligned relation to one another and cooperatively configured to engage an exterior surface of the respective blood vessel sections associated with each clamp,

(e) securement means interconnected between two of said clamps and disposed and structured for placement of said two clamps in spaced, adjacent and communicating relation to one another,

(f) said positioning means of said one clamp structured and disposed in substantially aligned relation to one another of said clamps when interconnected by said securement means and said gripping surfaces of each clamp structure terminating in an outer end and an inner end disposed on opposite longitudinal sides of said respective clamp structure, and

(h) whereby open attachable ends of the vessel sections on each one clamp are oriented to extend outwardly from said inner end of each positioning means into engageable relation with one another.

4,681,110

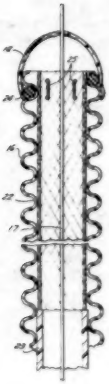
CATHETER ARRANGEMENT HAVING A BLOOD VESSEL LINER, AND METHOD OF USING IT

Dominik M. Wiktor, 4 Culin Dr., Cranford, N.J. 07016

Filed Dec. 2, 1985, Ser. No. 803,304

Int. Cl.[4] A61M *27/00*

U.S. Cl. 128—343 **15 Claims**



1. A catheter arrangement comprising:

a main flexible tubing for insertion into a blood vessel,

a resilient liner within the tubing, the liner being maintained in a radially compressed condition by the tubing and having a tendency to spring radially outwardly, and the liner being an open weave tube of criss-crossed strands, the tube being devoid of any obstruction to free passage of liquid and solids through the openings in the weave, and means for producing relative movement between the liner and tubing, while the tubing is located within a blood vessel, so that the liner escapes from the tubing and expands against the blood vessel wall.

4,681,111

ANALOG AND DIGITAL TELEMETRY SYSTEM FOR AN IMPLANTABLE DEVICE

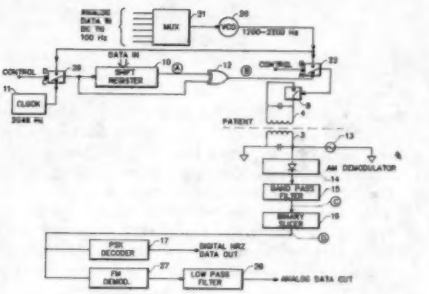
Sergiu Silvian, Pasadena, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 5, 1985, Ser. No. 720,556

Claims priority, application PCT. Int'l Appl., Mar. 27, 1986, PCT/US86/00645

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—419 PT **10 Claims**



1. A system for simultaneously transmitting digital and analog information from an implanted device to an external device, said system comprising:

frequency modulation means within said implanted device for generating a carrier signal and frequency modulating said carrier signal with analog information;

shift register means within said implanted device for holding digital data, said shift register means including means for serially clocking the digital data out of said shift register means in response to a clock signal;

means for applying said frequency modulated carrier signal from said frequency modulation means to said shift register means, said frequency modulated carrier signal comprising the clock signal that is used to serially clock the digital data out of said shift register means; and

transmitting means within said implanted device for serially transmitting to said external device the digital data clocked out of said shift register means by said frequency modulated carrier signal, whereby both said digital data and the analog information, used to modulate said frequency modulated carrier signal, are contained in the signal transmitted by said transmitting means.

4,681,112

MEDICAL INSTRUMENT INCLUDING ELECTRODES ADAPTED FOR RIGHT AND LEFT-HANDED USE

Paul W. Jones, Issaquah, and Casey M. Bardue, Seattle, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 689,741, Jan. 8, 1985. This application Oct. 1, 1986, Ser. No. 914,004

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 D **9 Claims**

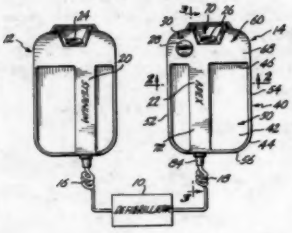
1. A medical instrument comprising first and second electrodes and means for applying an electric shock to a patient through the electrodes, each electrode comprising:

an elongated member adapted for gripping by the fingers of an operator's hand;

an actuator positioned adjacent one end of the elongated member;

an electrode element responsively connected to the actuator, the electrode element including means for receiving and transferring electrical energy; and

blocking means positioned adjacent one side of the elongated member;



the blocking means of the first electrode including means to hinder the operator from gripping the elongated member with the operator's right hand and simultaneously positioning the thumb of the right hand adjacent the actuator, the blocking means of the second electrode including means to hinder the operator from gripping the elongated member with the operator's left hand and simultaneously positioning the thumb of the left hand adjacent the actuator, whereby the first and second electrodes are adapted for left and right-handed use, respectively.

4,681,113

CORSET

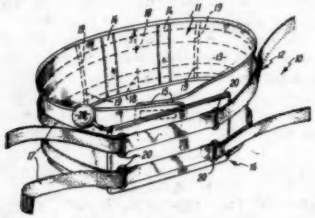
Carl W. Coplans, Cape Town, South Africa, assignor to Seton Products Limited, Oldham, England

Filed Sep. 3, 1985, Ser. No. 771,648

Claims priority, application South Africa, Sep. 3, 1984, 84/6881

Int. Cl.[4] A41D 27/12; A41C 1/00

U.S. Cl. 450—134 **17 Claims**



1. A corset comprising a first, inner, band-like structure made from resiliently extensible material and adapted to encircle waists of different girths, a second, outer, band-like structure of inelastic flexible material capable of securement around a wearer's waist in overlying disposition relative to the first band and adaptable to waists of different girths, and an inflatable bag supported by one of said structures in a use position overlying the wearer's abdomen.

4,681,114

WOODEN-SHOE TO TREAT HYPERLORDOSIS AND LIPODYSTROPHIA LOCATED IN THE THIGHS AND GLUTEI

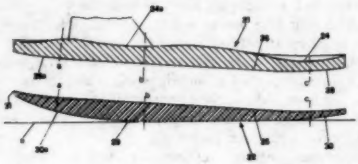
Alberto Lodispoto, Rome, Italy, assignor to Luigi Minonzio and Giovanni Verzilli, both of Rome, Italy, a part interest to each

Filed Jan. 7, 1985, Ser. No. 689,576

Claims priority, application European Pat. Off., Dec. 14, 1984, 84830340.0

Int. Cl.[4] A61F 5/14

U.S. Cl. 128—581 **11 Claims**



1. A wooden-shoe or sandal for treating hyperlordosis and lipodystrophia in the thighs and glutei, which comprises a rigid wooden top member having an upper surface with a generally orthopedic shape for supporting the sole of the foot of the user, and a bottom member forming the sole of the wooden-shoe, said shoe having an opposed heel and tip; the lower surface of said bottom member having a short, slightly upwardly and rearwardly curved back portion, a substantially flat middle portion extending forwardly from said back portion and terminating at the point corresponding to the location on the shoe of the metatarsal arch of the foot of the user, and a front end portion extending forwardly from said middle portion to said tip, said front end portion being sharply curved upwardly and forwardly to provide a gradually increasing rise with respect to the ground from said termination of said middle portion to said tip; said top member providing said upper surface with a rear surface portion correspondingly positioned at the slightly upwardly and rearwardly curved back portion of said bottom member lower surface for supporting the heel of the foot, a front surface portion correspondingly positioned at said front end portion of said bottom member lower surface for supporting the front of the foot and a middle surface portion extending forwardly from said rear surface portion to said front surface portion, said front surface portion being higher than said rear surface portion.

4,681,115

ELECTROCHEMICAL MEASURING CELL HAVING AN ANCILLARY ELECTRODE

Uvo Hölscher, Stockelsdorf, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 771,995, Sep. 3, 1985, Pat. No. 4,624,261. This application May 22, 1986, Ser. No. 866,578

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432950

Int. Cl.[4] A61B 5/04; G01N 27/52

U.S. Cl. 128—635 **6 Claims**

1. An electrochemical measuring cell comprising:

an electrolyte;

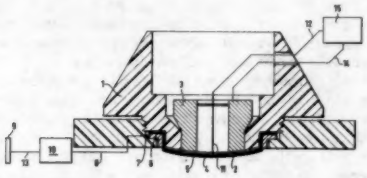
a measuring electrode disposed in said electrolyte;

a counter electrode also disposed in said electrolyte;

a housing for holding said electrolyte;

a diffusion membrane for separating said electrolyte from

the ambient and having a smooth outer surface facing away from said electrolyte; and,



an electrically-conductive, gas-permeable coating of silver applied to said outer surface for sensing an external electrical potential.

4,681,116

ANTIMONY ELECTRODE ASSEMBLY AND METHOD OF MANUFACTURE, AND USE THEREOF

Bert Settler, 723 Queenston Street, Winnipeg, Manitoba, Canada R3N 0X8

Filed Nov. 12, 1985, Ser. No. 796,704

Claims priority, application United Kingdom, Nov. 12, 1984, 8428543

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—635 **5 Claims**

1. An antimony electrode for pH measurement comprising in combination a relatively short length of antimony rod having an inner end and an outer or distal end secured by the inner end thereof, as by soldering to one end of a flexible conducting wire, the distal end of said rod being convex and substantially hemispherical and having a highly polished surface approaching a single, one plane crystal face, a relatively hard epoxy resin covering at least part of the length of said rod but with the distal end remaining exposed, a flexible plastic tube surrounding said rod the junction of said rod with said conducting wire and at least part of said conducting wire, with said distal end of said rod remaining exposed and a sealant between said portion of said plastic tube adjacent said distal end of said rod and said distal end of said rod thereby providing a sealing relationship of said plastic tube around said rod to prevent ingress of contaminants.

4,681,117

INTRACARDIAC CATHETER AND A METHOD FOR DETECTING MYOCARDIAL ISCHEMIA

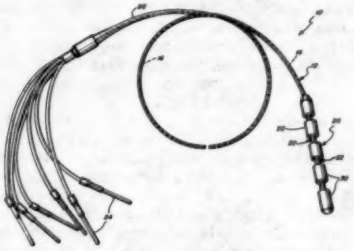
Richard F. Brodman, 3388 Wayne Ave., and Sharon B. Siegel, 3450 Wayne Ave., both of Bronx, N.Y. 10467

Continuation-in-part of Ser. No. 466,512, Feb. 15, 1983, abandoned. This application May 27, 1986, Ser. No. 868,893

Int. Cl.[4] A61B 5/04

U.S. Cl. 128—642 **10 Claims**

1. An intracardiac catheter for transmitting electric currents from the heart of a living subject to a monitor comprising: and electric lead including at least one electric conductor having first and second ends, an electrically insulating sheath covering a substantial portion of the conductor, sensing means connected to the first end of the conductor capable of detecting electric currents inside and emanating from major areas of the heart wall or all of the heart wall, and means connected to the second end of the conductor to connect the electric lead to the monitor; and means secured to the electric lead for preventing the sensing means from coming into direct contact with the endocardium of the heart for preventing the sensing means



from causing a current of injury, said electric lead, sensing means and means preventing the sensing means from coming into contact with the endocardium being sized to pass transvenously or transarterially into a ventricle of the heart.

4,681,118

WATERPROOF ELECTRODE ASSEMBLY WITH TRANSMITTER FOR RECORDING ELECTROCARDIOGRAM

Toshio Asai, Uchinadamachi; Yasuhiro Nakaya, Kanazawashi, and Yasuaki Onodera, Saitamaken, all of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

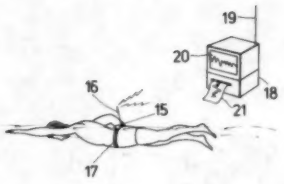
Filed Jun. 10, 1985, Ser. No. 742,823

Claims priority, application Japan, Jun. 11, 1984, 59-120380

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] A61B 5/04

U.S. Cl. 128—643 **1 Claim**



1. Apparatus for recording an electrocardiogram comprising a waterproof electrode assembly, said electrode assembly having a plurality of electrodes, and each of said electrodes comprising:

(a) a cup-shaped suction disc constructed from a waterproof, elastic material, said disc having a concave side, a convex side and a through-hole at the center thereof;

(b) an electrode plate having an outer peripheral edge hermetically sealed to the concave surface of said suction disc and closing said through-hole;

(c) a lead wire extending from said electrode plate past the convex surface of said suction disc;

(d) elastic sealing means for hermetically sealing together the outer peripheral edge of said electrode plate and the portions of the concave surface of said suction disc in contact with said peripheral edge of said electrode plate;

(e) elastic sealing means hermetically sealing the lead wire at the convex surface of the suction disc;

(f) an annular, body-surface adherent strip surrounding said electrode plate and bonded to the concave surface of the suction disc; and

(g) a wireless transmitter connected to said electrode.

4,681,119

METHOD OF PRODUCTION AND USE OF MICROBUBBLE PRECURSORS

Julia S. Rasor, Cupertino, and Ernest G. Tickner, Gilroy, both of Calif., assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 530,301, Sep. 8, 1983, which is a continuation-in-part of Ser. No. 322,138, Nov. 17, 1981, Pat. No. 4,442,843, which is a continuation-in-part of Ser. No. 207,741, Nov. 17, 1980, abandoned. This application Apr. 22, 1986, Ser. No. 854,622

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 16 Claims

1. In a method for altering the transmission characteristics of a liquid-filled region of the body other than the cardiovascular system to an electromagnetic or elastic wave transmitted therethrough by dispersing in the liquid an amount of microbubbles effective to substantially alter such transmission characteristics of the liquid in the area thereof containing the microbubbles, wherein the microbubbles are formed by dissolving in the liquid a solid which is particulate, is substantially free of microbubbles, and consists predominantly of particles which have a plurality of gas-filled voids communicating with the surface of the particles and a plurality of nuclei for microbubble formation and the ratio of the mass of the particles to the volume of gas in the voids is sufficient to render the liquid in which the particulate material is dissolved supersaturated with respect to the gas in the voids in the area of the liquid surrounding the microbubbles, the improvement wherein the liquid is sterile water or sterile aqueous galactose solution and the solid is galactose.

4,681,120

ULTRASONIC DIAGNOSING APPARATUS

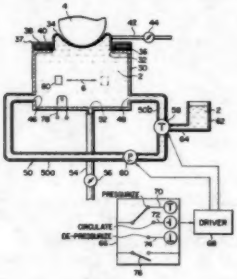
Yutaka Kunii, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1985, Ser. No. 696,055

Claims priority, application Japan, Feb. 3, 1984, 59-17092

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 12 Claims



1. An ultrasonic imaging apparatus for providing an image of a patient's breast comprising:

an impervious receptacle means for containing a liquid acoustic coupling medium, said receptacle means including a port means for accepting and discharging the liquid medium and an opening sized to accept the patient's breast, said port means including two inlet/outlet ports;

an ultrasonic-wave transmitting, impervious, flexible membrane attached to said receptacle means and covering said opening, said membrane serving to provide a flexible surface upon which the patient's breast is to be laid;

fixing means for fixing said membrane to said receptacle means in a liquid tight manner;

an ultrasonic probe means fixed within said receptacle means for transmitting ultrasonic beams into the patient's breast and receiving echos of the ultrasonic beams reflected from the patient's breast through the coupling medium and said membrane;

tank means for containing the medium;

pump means for feeding the medium from the tank into the receptacle means and discharging the medium from the receptacle means into said tank means; and

adjustment means for closely fitting the membrane against the region of the patient's breast to be imaged and selectively varying the distnace between the patient's breast and said probe means by selectively introducing or discharging the liquid medium through said port means and thereby adjusting the pressure of the liquid medium exerted against said flexible membrane; said adjustment means including a pipe connected at each end to the inlet/outlet ports of said port means and a three-way cock attached to the pipe, said tank means being in communication with said three-way cock and said pump being attached to the pipe, said three-way cock adapted to be shifted from a first mode in which the medium in the tank means is fed into the receptacle means by the pump to increase the pressure of the medium in the receptacle means, a second mode in which the medium in the receptacle means is circulated through the pipe by the pump, and a third mode in which the medium in the receptacle means is discharged into the tank to decrease the pressure of the medium in the receptacle means.

4,681,121

PROCESS FOR MEASURING SENSORY QUALITIES AND APPARATUS THEREFOR

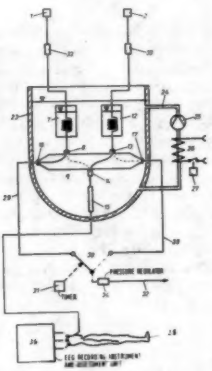
Gerd Kobal, Marquardsenstrasse 9, 8520 Erlangen, Fed. Rep. of Germany

Filed Jan. 15, 1986, Ser. No. 819,174

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501095

Int. Cl.[4] A61M *17/00*

U.S. Cl. 128—731 7 Claims



1. Method for measuring sensory qualities such as for measuring analgesia while monitoring anaesthesia on a patient, the method comprising the steps of:

passing stimulating pulses of vaporous or gaseous substances by means of a stimulating device over the nasal mucosa for triggering a specific stimulus;

said stimulating pulses being connected in series in a neutral vaporous or gaseous flow by means of a switching device thereby generating a continuous sequence of pulses with rapid changeover between the neutral vaporous or gaseous flow and the interpolated stimulating pulses, said flow being kept constant with respect to the flow characteristics thereof;

deriving stimulus correlated electrical signals from the electro-encephalogram of the patient by means of a recording instrument; and,

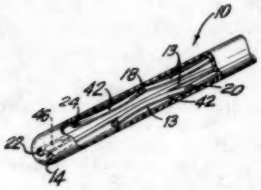
analyzing and storing said electrical signals as measured quantities in an assessment unit, said electrical signals being analyzed in an assessment window having a width corresponding to a predetermined number of said stimulating pulses and said assessment window being displaceable over the number of signals stored in said assessment unit.

4,681,122

STEREOTAXIC CATHETER FOR MICROWAVE THERMOTHERAPY

Arthur Winters, Short Hills, and Casper S. Molee, Bloomfield, both of N.J., assignors to Victory Engineering Corp., N.J.

Filed Sep. 23, 1985, Ser. No. 779,285
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—736 **5 Claims**



1. Apparatus for microwave thermotherapy comprising:

a catheter;

said catheter being insertable into living tissue;

at least first and second lumens extending along a substantial axial distance within said catheter;

said first and second lumens each including a proximal end and a distal end;

said distal end of each of said first and second lumens being sealed;

said proximal end of each of said first and second lumens including means for permitting the passage of electrical conductors therethrough;

a microwave antenna positionable within said first lumen, and effective, when said catheter is inserted into living tissue, and said microwave antenna is energized with microwave energy, for increasing a first temperature of a portion of said living tissue in a vicinity of said catheter; and

a temperature sensor positionable within said second lumen and effective for measuring a second temperature within said second lumen related to said first temperature, whereby said microwave energy may be controllable to maintain said first temperature within predetermined limits.

4,681,123

CHORION BIOPSY INSTRUMENT

Konstantin L. Valtchev, 43 Cosmic Drive, Don Mills, Toronto, Ontario, Canada

Filed Oct. 31, 1986, Ser. No. 925,729
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—753 **4 Claims**

1. A chorion biopsy instrument comprising:

a housing;

a first elongated tube operably attached to said housing, said first tube having a first passageway therein, said first tube being closed at one end thereof and having an opening in one side thereof adjacent to said one end, said opening being in fluid communication with said first passageway;

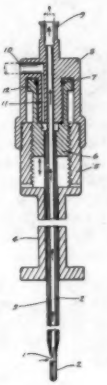
means attached to said housing for fluidly connecting a vacuum producing device to said first passageway;

a second elongated tube telescopically disposed over said first tube, said second tube having a large enough internal diameter to form a second passageway between the inside of the second tube and exterior of the first tube;

means attached to one end of the second tube for fluidly sealing to some extent against the exterior of the first tube;

means connected to said housing in fluid communication with said second passageway for connection to a reservoir of culture medium; and

positioning means operably attached to said housing and to said first and second tubes for reciprocally moving one of



said first and second tubes with respect to the other between a first relative position wherein said opening in the side of the first tube is covered by said second tube and is therefore in fluid communication with said second passageway and a second position wherein said second tube does not cover said opening in the first tube whereby the first and second tubes can be inserted into the uterine cavity through the cervical canal while in the first position thereof, a chorion tissue culture can be taken while moving the tubes to the second relative position thereof and a culture medium can be pulled through the second passageway by suction from action of the vacuum producing device to carry the chorion tissue through the opening in the first passageway to the syringe for testing.

4,681,124

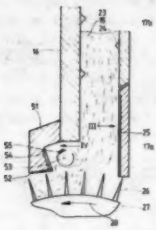
APPARATUS FOR MANIPULATING PARTICLES OF TOBACCO OR FILTER MATERIAL

Alfred Hinzmann, Weams; Peter Preisner, Quinton, and Erich Presser, Richmond, all of Va., assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 729,540
Int. Cl.[4] A24C *5/39*
U.S. Cl. 131—109.1 **37 Claims**

1. Apparatus for manipulating fibrous material, particularly for manipulating particles of tobacco in the distributor of a cigarette maker, comprising an at least substantially upright duct defining an elongated passage having an inlet at the upper end and an outlet at the lower end thereof, said duct comprising parallel first and second walls which are disposed opposite each other and flank said passage; means for supplying fibrous material into said inlet so that the material advances in said passage in a first direction toward said outlet; and drive means for imparting to one of said walls and to a portion of the other

of said walls an oscillatory movement in a second direction substantially at right angles to said first direction and in the



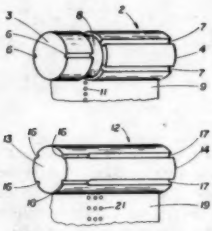
general planes of said walls to thus promote the distribution of fibrous material across said passage.

4,681,125

MOUTHPIECE FOR TOBACCO SMOKE ARTICLE

Robert R. Johnson, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 6, 1985, Ser. No. 708,630
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 **7 Claims**



1. An improved tobacco smoke article comprising: a smoke impervious plug member having an upstream tobacco smoke inlet end, adjacent to a tobacco rod, and a downstream mouth outlet end; longitudinally extending groove means along the periphery of said plug member extending from said smoke inlet end to said mouth outlet end substantially parallel the longitudinal axis of said plug member, said groove means having a smaller cross-sectional area adjacent said smoke inlet end than adjacent said mouth outlet end of said plug member; apertured tipping material enveloping said plug member with the apertures therein in communication with said groove means; said plug member being blocked adjacent said inlet end so as to be impervious to smoke flow so that said longitudinally extending groove means forms the passage for smoke flow from said smoke inlet end to said mouth outlet end of said plug member.

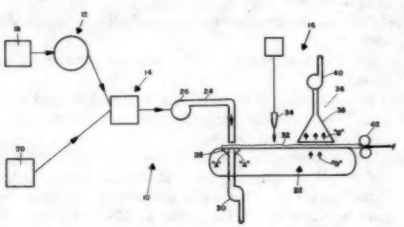
7. An improved cigarette comprising: a generally cylindrical smoke impervious plug member having an upstream tobacco smoke inlet end, adjacent to a tobacco rod, and a downstream mouth outlet end and an overall length in the range of approximately 14 to approximately 35 mm; a first set of longitudinally extending grooves consisting of a pair of opposed spaced substantially parallel peripheral grooves longitudinally extending in the peripheral wall of said plug member from said smoke inlet end of said plug member toward said mouth outlet end of said plug member with the grooves thereof having cross-sectional areas corresponding to aerodynamic groove diameters of approximately 0.4 to approximately 0.6 mm; a second set of grooves consisting of four equally spaced substantially parallel peripheral grooves longitudinally extending in the peripheral wall of said plug member from said mouth outlet end of said plug member toward said smoke inlet end of said plug member with the grooves thereof having cross-sectional areas corresponding to aerodynamic groove diameters in the range of approximately 0.5 to approximately 1.2 mm, said second set of longitudinally extending grooves being approximately three to four times the length of said first set of longitudinally extending grooves with the grooves of said first and second sets being peripherally offset from each other; an annular peripheral groove in said plug member intermediate said first and second sets of longitudinally extending peripheral grooves to communicably connect the groove sets of said plug member; a tipping paper wrap enveloping said plug member, said tipping paper wrap having a row of spaced ventilating apertures positioned to communicate with said annular peripheral groove in said plug member; said plug member being blocked adjacent said smoke inlet and mouth outlet ends so as to be impervious to smoke flow so that said groove sets form the passage for smoke flow from said smoke inlet end to said mouth outlet end of said plug member.

4,681,126

PROCESS FOR MANUFACTURING RECONSTITUTED TOBACCO

David G. Strubel, Jeffersontown, and Robert A. Sanford, Prospect, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 612,166, May 21, 1984, abandoned.
This application Jul. 28, 1986, Ser. No. 889,669
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—370 **18 Claims**



1. A method for manufacturing reconstituted tobacco of tobacco stems and tobacco fines comprising:

a. treating the stem parts of tobacco is essentially a dry form to reduce the stem to substantially fibrous form;

b. mixing the fibrous stem with fine lamina tobacco;

c. conveying the mixture in an air stream and subsequently depositing the mixture of fibrous stem and fine lamina tobacco on a moving wire mesh continuous belt;

d. passing said air stream through the tobacco mixture on the wire mesh belt for homogenizing the fibrous stem and fine tobacco lamina throughout the mixture

and causing intertwining of the fibrous stems and forming a continuous non-woven felt sheet of fibrous stem and fine lamina tobacco;

e. applying a binder to the non-woven felt sheet of fibrous stem and fine lamina tobacco as the felt sheet continues to move on the wire mesh belt;

f. drying the binder; and,

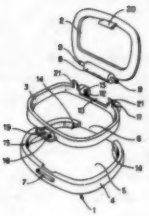
g. removing said non-woven felt sheet of fibrous stem and fine lamina tobacco from the wire mesh belt in such a form for use in the manufacture of tobacco smoking articles.

4,681,127

RIGID MAKE UP COMPACT WITH A FLEXIBLE INNER SHELL FRAME

Jean-Louis H. Gueret, Paris, France, assignor to "L'Oreal", Paris, France

Filed May 21, 1984, Ser. No. 612,724
Claims priority, application France, May 27, 1983, 83 08806; Mar. 5, 1984, 84 03364
Int. Cl.[4] A45D *33/00*
U.S. Cl. 132—82 R 32 Claims



1. A compact which is intended to enclose at least one make-up product of a solid consistency, and which comprises:

(a) first and second main elements made of a relatively rigid material, one of said main elements constituting a base of the compact and the other said main element constituting a lid of the compact;

(b) fastener means comprising at least two members having parts of complementary shape, in order to secure the two main elements to each other to keep them applied against each other in the closed position of the compact;

(c) means movably mounting at least one of said members relative to said base of the compact in order to allow the manipulation of the fastener means for actuating closing and opening of the compact;

(d) a shell frame made of a relatively flexible material being mounted in said first main element of the compact;

(e) hinge means mounting said first and second main elements of the compact for relative movement between the closed position and an open position of the compact;

(f) means defining a passage in said first main element and movably receiving one of said members of the fastener means;

(g) a resiliently deformable zone on said shell frame; and

(h) means mounting the other said member of the fastener means on said lid of the compact;

wherein said means movably mounting said one member of the fastener means connects said one member to said resiliently deformable zone; said one member of the fastener means is accessible from outside the compact, in said closed position, by means of said passage arranged in said base; whereby manipulation of the said one member of the fastener means so as to actuate opening of the compact deforms said resiliently deformable zone of the shell frame so as to release the said one member from the other member of the fastener means;

said hinge means comprising first and second hinge elements, said first hinge element being carried by said shell frame and said second hinge element being carried by said second main element of the compact;

said other of said members of said fastener means including a catch extending from said lid toward said base, said one of said members including a catch member on said shell frame, said shell frame further including ramp means diposed so that upon said manipulation of said one member of said fastener means, said ramp means will engage said catch and move said catch and said lid in a direction away from said base.

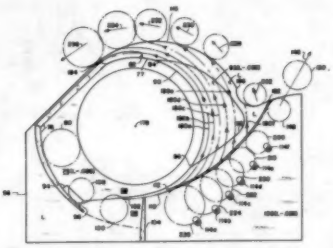
184-023 O.G.-87-5

4,681,128

COIN SORTER

Victor G. Ristvedt, Rte. 8, Box 8904, and Mark E. Ristvedt, 1000 Woodland Ct., both of Manchester, Tenn. 37355

Filed Jun. 23, 1986, Ser. No. 877,205
Int. Cl.[4] G07D *3/16*
U.S. Cl. 453—6 5 Claims



1. A coin sorter for mixing denominations of coins, coins of a different diameter, comprising:

a rotatable resilient disc;

means for rotating said disc;

a stationary sorter plate spaced from said disc, said sorter plate having a central opening through which coins may be placed on said disc, said sorter plate being characterized by:

a first surface closer to said disc than the thickness of the thinnest coin to be sorted,

second surfaces less close to said disc than said first surfaces,

a first guide edge formed at a junction region between said first surface and a said second surface comprising a first inwardly facing edge against which a sequential line of coins is formable, and

a second guide edge at a second juntion region between a said first surface and a said second surface comprising a second, and tapered, edge formed circumferentially beyond said first guide edge, in the direction of rotation of said disc, and said second guide edge extending outwardly, coins being rotated by said disc under a said second surface region to said second guide edge and then being moved outward along said second guide edge as a result of the rotation of said disc; and

sorting means for engaging coins riding along said second guide edge and pressing a discrete diameter of coin against said second guide edge, and by virtue of said taper of said second edge, causing said last-named coin to ride under said second guide edge and being engaged by a said first surface region and rotated under a said first surface region, and said last-named first surface region having an outer edge which is positioned to be intercepted by coins rotated under said first surface from said second edge at a discrete location for each diameter of coin;

whereby coins of a discrete size are released from said sorter at different positions around said sorter.

4,681,129
APPARATUS FOR UNIFORMLY DISTRIBUTING A TWO-PHASE MIXTURE

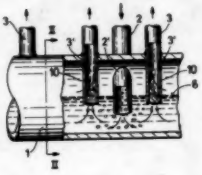
Heinz Juzi, Andelfingen, and Marco L. Bernasconi, Lustmuhle, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 19, 1985, Ser. No. 766,931

Claims priority, application Switzerland, Aug. 24, 1984, 4046/84

Int. Cl.[4] B67D *5/54*

U.S. Cl. 137—154 **15 Claims**



1. An apparatus for uniformly distributing a two-phase mixture comprising

a receptacle;

at least one supply line communicating with said receptacle to deliver a two-phase mixture of liquid and gas therein with an interphase level forming between the phases; and

at least one discharge line communicating with said receptacle to discharge a uniform mixture of the two-phase mixture therefrom, said discharge line extending into said receptacle and having at least one inlet orifice within said receptacle extending through said interphase level for passage of the uniform mixture of the two-phase mixture into said discharge line, said orifice having a vertically disposed component and being of a horizontal width at a lowest level thereof at least equal to the horizontal width of the remainder of said orifice said orifice being wetted by the liquid phase at least at the lowest operating interphase level.

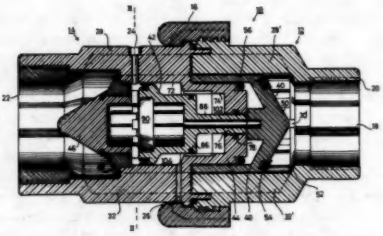
4,681,130
COMBINED PRESSURE REGULATED AND CHECK VALVE

Elhanan Tabor, Carmiel, Israel, assignor to "AR-KAL" Plastics Products (1973), Beit-Zera, Israel

Filed Sep. 11, 1986, Ser. No. 906,162

Int. Cl.[4] F16K *31/122*

U.S. Cl. 137—220 **2 Claims**



1. A combined pressure-regulated and check fluid flow valve comprising an inlet port, an outlet port, and pressure-control means for actuating the valve, characterized by:

an inlet port section and an outlet port section, coupled to each other to form a valve housing configured as a uniform extention of a pipeline to which the valve is adapted to be connected;

a freely-reciprocable, generally cup-shaped valve member and associated valve seat provided at the inlet port section for closing the valve against the incoming fluid flow;

a first, freely-reciprocable differential piston member provided downstream of the valve member, and having first, second and third piston portions of gradually decreasing cross-sections ,the third portion being extended to project into the hollow of and to abut against an inner portion of the valve member;

a first fixed cylinder member having first, second, and third inner cylinder portions for slidably supporting the first piston member portions, respectively, and an outer cylinder portion for the cup-shaped portion of the valve member;

a second, freely-reciprocable piston member provided downstream of the first piston member and comprising an extended portion upstream thereof adapted to abut against the said first piston member;

a second, fixed cylinder member slidably supporting the second piston member;

first passage means for introducing the actuating control pressure into the said first cylinder downstream of the first piston portion; and

second passage means for relieving pressurized fluid from the first cylinder downstream of the second piston portion.

4,681,131
LIQUID CLOSING DEVICE

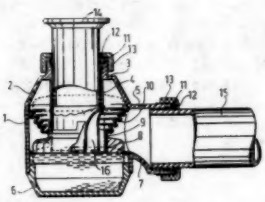
José I. Uriarte, 20 General Alava, Vitoria, Spain

Filed Jan. 30, 1986, Ser. No. 824,283

Claims priority, application European Pat. Off., Feb. 1, 1985, 85200127.0

Int. Cl.[4] E03C *1/28*

U.S. Cl. 137—247.35 **19 Claims**



13. A drain device comprising the combination of:

a drain body having a circumscribing side wall, a bottom wall, an open top and a drain passage intersecting said side wall above the level of said bottom wall so as to define a liquid retention space therebelow;

vertically extending pipe means connected with said body for closing said open top thereof and defining a space within said body between the body and the pipe means and which space is in communication with said drain passage, said pipe means having a lower end portion presenting an outer guide surface portion and extending downwardly in said space to a level above said level of the bottom wall;

float means slidably guided on said guide surface portion of the pipe means for liquid-buoyed vertical movement thereon above and below the bottom level of said drain passage while effecting a circumferential seal with liquid buoying the float means which is in surrounding relation to said outer surface of the pipe means; and

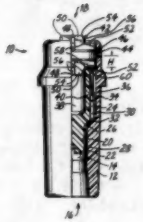
flexible membrane means connected with said float means for defining an isolated space around said pipe means upwardly from said float means and for allowing said vertical movement of said float means.

4,681,132

CHECK VALVE WITH PRESET CRACKING PRESSURE

George E. Lardner, North Seminole, Fla., assignor to Halkey-Roberts Corporation, St. Petersburg, Fla.

Filed May 23, 1986, Ser. No. 867,319
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—271 7 Claims



1. A check valve, comprising in combination:

a valve body having a central axial passageway therethrough defining an input and an output and having valve seat means therein;

valve element reciprocatingly positioned within said axial passageway, said valve element having valve seat means in sealingly engagable position with said valve seat means of said valve body when said valve element is urged forwardly toward said input and having a resilient rearward portion; and

a plug positioned within said output of said axial passageway to entrain said valve element within said axial passageway, the distance between said plug and said valve seat means of said axial passageway being appreciably shorter than the distance between the valve seat means of said valve element and said plug, whereby said valve element is urged forwardly to resiliently seal both said valve seat means together thereby defining a cracking pressure necessary to unseat the valve seat means of said valve element and said axial passageway.

4,681,133

ROTATABLE BALL VALVE APPARATUS AND METHOD

Harry Weston, West Sussex, United Kingdom, assignor to Hydril Company, Los Angeles, Calif.

Filed Nov. 4, 1983, Ser. No. 549,256
Claims priority, application United Kingdom, Nov. 5, 1982, 8231601; Nov. 11, 1982, 8232226; Dec. 20, 1982, 8236158; May 20, 1983, 8313970
Int. Cl.[4] F16K *11/087, 51/00*
U.S. Cl. 137—315 47 Claims

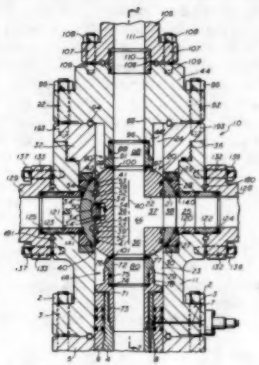
1. A safety valve comprising,

a housing having at least one lateral outlet, an upper passage and a lower passage, each of the outlet and upper and lower passages being open to a chamber in the housing, and

a rotatable ball having

an outer part with means for seating it within the chamber, said outer part having an insert cavity along a central axis of the outer part, the insert cavity having an inner diameter substantially the same as or less than that of the upper passage, said outer part having a perpendicular passage extending from the insert cavity to the exterior of the outer part, and

a removable inner part disposed in said insert cavity and having an outer diameter substantially the same as that of the insert cavity of the outer part and having a head passage communicating with a base passage, the head passage



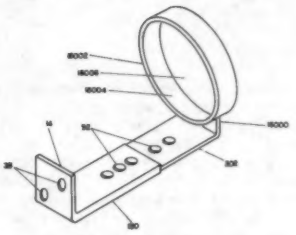
being along said central axis and the base passage being aligned with the perpendicular passage of the outer part.

4,681,134

VALVE LOCK

Raymond L. Paris, Sr., 3007 Bud Ct., Rte. 8, Joliet, Ill. 60436

Filed Jul. 23, 1986, Ser. No. 888,591
Int. Cl.[4] F16K *35/00*
U.S. Cl. 137—385 9 Claims



1. A valve lock for the outlet valve of a tank truck comprising a rigid elongated member to bear against a portion of said outlet valve when its operator mechanism is attempted to be moved from a valve closed position to a valve open position when said valve lock is in its operative position, including said outlet valve and said operator mechanism thereof movable between a valve closed position and a valve open position, said valve lock including an upstream end for positioning at an upstream portion of said outlet valve when in its operative position and a downstream end for positioning at a downstream portion of said outlet valve when in its operative position, anchor means to anchor said rigid elongated member of said valve lock at said upstream end relative to said outlet valve to restrain movement of said upstream end of said rigid elongated member when so anchored, lock means to prevent movement of said valve operator mechanism of said outlet valve from its said valve closed position to a valve open position at said downstream end relative to said outlet valve when said lock means is operatively connected to said valve operator mechanism, said rigid elongated member having a bearing side edge extending between said upstream end of said valve lock and said downstream end of said valve lock, said bearing side edge being in abutting relationship with said outlet valve and facing in a first direction toward said outlet valve when said

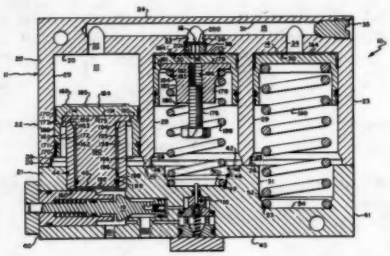
upstream end of said value lock is anchored and said downstream end of said valve lock is connected to said valve operator mechanism by said lock means, a portion of said valve operator mechanism being movable when not connected to said valve lock toward said first direction to begin movement of said valve operator mechanism from its said valve closed position to its said valve open position, said downstream end of said valve lock being connected to said portion of said valve operator mechanism which is movable toward said first direction whereby said bearing side edge abutting against said outlet valve restrains said downstream end of said valve lock and said portion of said valve operator mechanism connected thereto from movement toward said first direction until disconnected from said valve lock.

4,681,135

TIME-DELAY VALVE

Alfred J. Tillman, Temple Terrace, Fla., assignor to Moog, Inc., East Aurora, N.Y.

Filed Apr. 18, 1986, Ser. No. 854,403
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—489.5 **17 Claims**



1. A time-delay valve adapted to be associated with a source of pressurized first fluid, comprising:

a body having an inlet, an outlet, a first passageway communicating said inlet and outlet, said first passageway including a main passageway portion communicating said inlet with said outlet and including a pilot passageway portion communicating said inlet with said main passageway portion, a first seat surrounding said pilot passageway portion, a first chamber, and a connecting passageway communicating with said first chamber, said first chamber having a first wall portion movable relative to said body so as to vary the volume of said first chamber, said first wall portion being biased toward a position at which the volume of said first chamber will be at a minimum, said inlet being adapted to selectively receive first fluid from said source;

a second fluid occupying said first chamber and said connecting passageway;

a restricted orifice arranged in said connecting passageway so as to impede a flow of second fluid into said first chamber;

pressurizing means for causing second fluid to flow through said restricted orifice and enter said first chamber when said first fluid is admitted to said inlet;

a first valve element mounted for movement toward and away from said first seat, said first valve element being biased to move toward said seat to normally close said pilot passageway portion;

a second seat surrounding said main passageway portion; and

a second valve element mounted in said main passageway for movement toward and away from said second seat, said second valve element being biased to move toward said second seat to normally close said main passageway portion; and

a member mounted for movement with said first wall portion, and arranged to selectively engage said first valve element, said member being movable from a first position to a second position between which said member will not displace said first valve element off said first seat, and being further movable beyond said second position after which said member will displace said first valve element off said first seat;

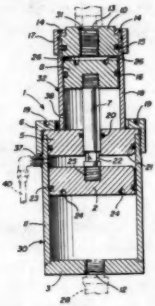
whereby, said first fluid will not flow through said first passageway until said member has moved beyond said second position and has displaced said first valve element off said first seat.

4,681,136

GAS FLOW PULSATION DAMPENER AND PRESSURE DIFFERENTIAL CONTROL

Richard J. Sequeira, 941 Karen Dr., and Frank R. Valadez, 1011 Phillips Rd., both of Yuba City, Calif. 95991

Filed Feb. 7, 1986, Ser. No. 827,053
Int. Cl.[4] F16K *31/365*
U.S. Cl. 137—494 **5 Claims**



1. In combination with an expansible sleeve-type gas flow control valve, a pressure differential control device comprising a primary piston and cylinder assembly having one end of the primary cylinder filled with hydraulic fluid and being in flow communication with the exterior of a resilient sleeve of the valve for supplying control pressure thereto, the other end of the primary cylinder being in gas flow communication with the outlet of the valve so as to relate the control pressure proportionately to the outlet pressure of the valve thereby controlling differential pressure as between the valve inlet and cutlet, said primary piston being mechanically linked by a piston rod to a smaller diameter secondary piston in a secondary cylinder, the rod end of the secondary cylinder being ported to atmosphere and the other end of the secondary cylinder being filled with hydraulic fluid and in communcation with an accumulator so as to provide pulsation dampening of the valve.

4,681,137

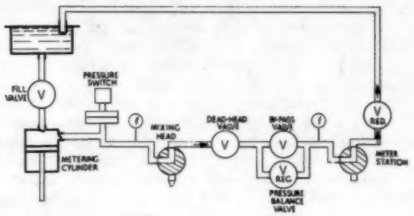
REACTION INJECTION MOLDING PRESSURE DEVELOPING AND BALANCING CIRCUIT

James R. James, Clarksville, Ind., assignor to Accuratio System Inc., Clarksville, Ind.

Continuation of Ser. No. 281,401, Jul. 8, 1981, abandoned. This application May 7, 1986, Ser. No. 861,634
Int. Cl.[4] B29C *45/00*
U.S. Cl. 137—568 **7 Claims**

1. Pressure developing and balancing circuit means for reaction injection molding comprising a reactant liquid reservoir, means for highly pressurizing reactant liquid supplied from said reservoir, mixing head means, pressure balance cylinder means, pressure regulating counterbalance valve means, accumulator means, circuit means for conducting said reactant liquid through relatively unrestricted passages to and past said

mixing head means and to tone end of said pressure balance cylinder means, displaceable pressure transmitting means within said pressure balance cylinder means for separating liquids at the respective ends of said cylinder means, circuit means for conducting a non-reactant liquid from the other end of said pressure balance cylinder means to said accumulator means through regulating valve means restrictions in said



counterbalance valve means responsive to upstream pressure for maintaining a high pressure in said other end of the pressure balance cylinder whereby an upstream regulated high pressure head may be maintained on said reactant liquid at said one end of said pressure balance cylinder means and back through said unrestricted passages at said mixing head without said reactant liquid passing through a resstrictive valve.

4,681,138

VALVULAR DEVICE FOR THE INFLATION OF BALLOONS, PARTICULARLY BALLOONS SUPPORTED BY TUBULAR SHAFTS

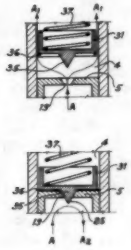
Giovanni Giuliani, San Michele, Italy, assignor to VECA S.r.l., San Michele Alessandria, Italy

Filed Jul. 25, 1985, Ser. No. 759,122

Claims priority, application Italy, Aug. 1, 1984, 22180 A/84; Dec. 21, 1984, 24236 A/84; Dec. 21, 1984, 24222 B/84; Feb. 8, 1985, 20760 B/85; Apr. 11, 1985, 21408 B/85; Apr. 11, 1985, 20305 A/85

Int. Cl.⁴ F16K *15/20*; A63H *27/10*

U.S. Cl. 137—516.29 **12 Claims**



1. A device for inflating a balloon, wherein a fluid is introduced into the balloon to reach the desired inflation pressure, the balloon having a neck, the balloon being supported by tubular shafts, one shaft extending to the exterior and the other into the interior of the balloon, and a one-way containment system for the inflation fluid, which comprises a one-way valve, mounted in or at one end of the tubular shaft which extends to the exterior of the balloon and inserted into the neck of the balloon; a said valve having an external shape which deforms the neck of the balloon elastically and assures maintenance of said inflation pressure, while allowing sliding inside said neck, and an inner shape which allows the insertion of said shafts, and the installation of the one-way containment system for the inflation fluid in the central section, said valve comprising an upper part and a lower part, said lower part having ribs to seal the neck of the balloon, the upper part forming the one-way valve, said shaft which extends to the exterior of the balloon being press-fitted against the lower part, said shaft which extends into the interior of said balloon being press-fitted against said upper part and wherein said upper part and lower part of said valve form a cylindrical cavity enclosed by two bases, the base farther from the balloon having a first central axial hole and the base closer to the balloon being provided with a second central axial hole, said bases being spaced by a distance less than the diameter thereof, said one way containment system comprising a sealing element freely slidable in said cavity and having a diameter less than the diamter of each of said bases and greater than the sum of the radius of either of said bases and the diameter of said first central hole.

4,681,139

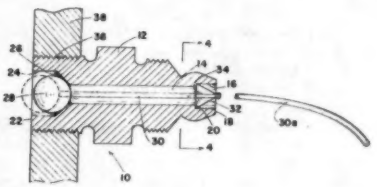
ELASTOMER BALL CHECK VALVE

Ralph A. Falconer, Novato, Calif., assignor to Jandy Industries, Novato, Calif.

Filed Apr. 7, 1986, Ser. No. 848,763

Int. Cl.⁴ F16K *15/04*

U.S. Cl. 137—537 **7 Claims**



1. A check valve comprising:

a valve body having a flow passageway therethrough;

a valve seating surface on said body at and around one end of said flow passageway;

a retaining surface on said body around the other end of said flow passageway;

a valve stem of an elastomeric material;

a valve plug fixed on one end of said stem engagable around said seating surface; and

lateral extensions of said elastomeric material integral with said stem engagable with said retaining surface;

said lateral extensions being in the general form of right triangles with inwardly tapering surfaces directed toward the other end of said stem to enable insertion of said other end and said lateral extensions into said flow passageway.

the elastomeric material of said lateral extensions enabling distortion of said lateral extensions for passageway thereof through said passageway;

said lateral extensions having radial surfaces seating against said retaining surface.

4,681,140

TUB-SHOWER DIVERTER APPARATUS

Dennis J. Hayman, Plano, Tex., assignor to United States Brass Corporation, Fort Worth, Tex.

Filed Nov. 26, 1986, Ser. No. 935,511

Int. Cl.⁴ F16K *7/12, 11/20*

U.S. Cl. 137—597 **9 Claims**

1. A tub-shower diverter comprising:

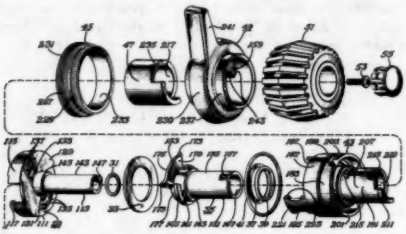
a. a diverter chamber, diverter seal means, and diverter cam means;

i. said diverter chamber comprising a planar annular surface pierced by first opening means that communicates with an inlet water supply, and by second and third opening means that communicate respectively with a tub outlet and a shower outlet, and with said first open-

ing means being spaced radially from said second and third opening means;

ii. said diverter seal means being disposed within said diverter chamber and being an elastomeric washer sized to overlay said second and third opening means, but not said first opening means;

iii. said diverter cam means comprising a cam portion and a stem portion, with said cam portion disposed within said diverter chamber and underlying a portion of said elastomeric washer to prevent that portion from engaging said planar annular surface, with rotation of said



stem portion permitting selection of the portion of said elastomeric washer that will not be engaged with said planar annular surface;

iv. means for controlling the rotational position of said stem portion;

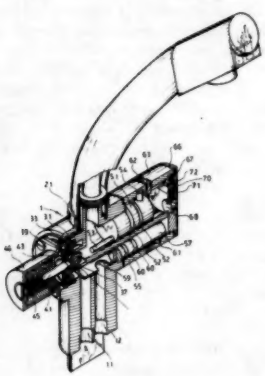
whereby, pressure of water admitted to said diverter chamber from said inlet supply will force said elastomeric washer into sealing engagement with said planar annular surface except where prevented by said cam portion, so that either one or both of said second or third opening means may be selectively sealed.

4,681,141

LIGHT-DETECTOR, HAND-CONTROLLED FAUCET WITH WATER TEMPERATURE REGULATOR

Wen-Ching Wang, Room 10-12, No. 2, Fu Hsin N. Rd., Taipei, Taiwan

Filed Feb. 3, 1986, Ser. No. 825,434
Int. Cl.[4] F16K *11/07, 31/11, 31/528*
U.S. Cl. 137—607 **5 Claims**



1. A light-detector, hand-controlled faucet with water temperature regulator comprising in combination:

(a) a cross-type manifold having an end which can be connected to a source of water, said source including a pipe for supplying hot water and a pipe for supplying cool water;

said manifold also having a tubular transverse portion for mounting in it a respective cylindrical valve control post, said tubular transverse portion including a first walled selector slot, said tubular transverse portion including a water outlet, and said water outlet including a circular pipe coupling, and said tubular transverse portion including a valve aperture including a tubular projection and a circular, walled valve-connecting opening;

said manifold having a water temperature control section for mounting in it a respective cylindrical water temperature control post, said water temperature control section having a first end adapted to communicate with the hot water pipe and the cool water pipe, and said water temperature control section including a second walled slot at the end thereof which is opposite from said end adapted to communicate with the hot water pipe and the cool water pipe;

said manifold having a mixed water outlet positioned in communication at the hot water pipe; and

said manifold having an electric wire conduit extending from the space between said circular pipe coupling and said water outlet to the respective lateral end surface near said circular valve-connecting opening of the transverse section of said manifold;

(b) a circular tie ring with a circular protuberance around its center and a tubular water pressure pipe at its peripheral surface, said circular tie ring being adapted to be operatively seated in said circular valve-connecting opening of said manifold;

(c) a pliable valve sleeve, said pliable valve seat being adapted to be operatively seated in said circular valve-connecting opening of said manifold, said pliable valve sleeve having an outer diameter in conformity with the inner wall of said valve-connecting opening of said cross-type manifold, said pliable valve sleeve having a shoulder as extension of its peripheral surface, and said pliable valve sleeve having a valve cover with an outer diameter just equal to that of said valve-connecting opening of said cross-type manifold and with a connection hole at the center of said valve cover, and a hole in said shoulder for communication with said tubular water pressure pipe of said tie ring;

(d) a valve extender adapted to be seated at least in said pliable valve sleeve, said valve extender having a conical head, a neck with an outer diameter in conformity with that of the connecting hole in said shoulder of said pliable valve sleeve, a cylindrical portion, a disc-shaped recess in its bottom, and a tubular water pressure balance duct extending along its center;

(e) an annular connection cover adapted to be seated in said valve-connecting opening of said cross-type manifold, said annular connection cover having a stop hole for communication with said tubular water pressure pipe of said circular tie ring;

(f) a metal extending pin with magnetic properties;

(g) a pliable cylindrical stop head operatively connected at one end of said metal extending pin;

(h) an extending pin container comprising a dish-shaped portion and a tubular extension, for containing said extending pin;

(i) a compression spring, operatively mounted in said tubular extension of said extending pin container;

(j) an induction coil for mounting in it said extending pin container and said compression spring in said induction coil, said induction coil being adapted to be operatively connected to said cross-type manifold;

(k) a cylindrical valve control post which is adapted to operatively disposed in and which corresponds in diameter to said tubular transverse portion of said cross-type manifold, said cylindrical valve control post having two leak-proof rings mounted at its central portion, said cylindrical valve control post having at its front end a pin adapted to be aligned with the center of said valve aper-

ture in said tubular transverse portion of said cross-type manifold, and said cylindrical valve control post having a cylindrical selector element corresponding in size to said first selector slot in said tubular transverse portion of said cross-type manifold;

(l) a valve control ring having a first groove at its inner wall for cooperating with said cylindrical selector element of said cylindrical valve control post;

(m) a cylindrical water temperature control post adapted to be operatively mounted in and having a diameter in conformity with said water temperature control section in said cross-type manifold, said control post having a hollow rear tubular section, a water outlet at said rear end, and a water inlet in the central portion of said hollow rear tubular section at a position in conformity with the cool water pipe, said cylindrical water temperature control post having two leak-proof rings mounted at its central portion, and said cylindrical water temperature control post having beneath its forward end a cylindrical selector duct corresponding in size to said second selector slot of said water temperature control section of said cross-type manifold;

(n) a ring with a projecting block at its inner circumference corresponding to said first selector slot for cooperating therewith;

(o) a temperature control ring having an oblique groove in its inner wall for cooperating with and corresponding in size to said second walled slot of said water temperature control section of said cross-type manifold, and said temperature control ring also having a plurality of openings along its inner wall;

(p) a circular temperature setting disc adapted to be connected at said temperature control ring and having a mounting block, at least one rectangular opening, and a pin hole in said block above said opening, and said temperature setting disc having a central round hole, and two screw holes below said central hole;

(q) a temperature setting pin adapted to be mounted in and corresponding in diameter to said pin hole in said block of said temperature setting disc;

(r) a compression spring for said circular temperature setting disc and adapted to be positioned beneath said block of said circular temperature setting disc;

(s) a disc-shaped cover having four equidistant retainer blocks arranged about at one side about its center;

wherein said valve extender neck is inserted in said pliable valve sleeve, and clamped by said circular tie ring at one side and said annular connection cover at the other side, with said water pressure pipe of said circular tie ring passing through said hole in said shoulder of said pliable valve sleeve and said stop hole of said annular connection cover, and said valve extender neck is fixed in said stop hole of said annular connection cover;

wherein said selector element of said cylindrical valve control post is located within said first groove in said valve control ring, with said valve control post and said valve control ring being connected to said cross-type manifold in such a way that said cylindrical selector element is cooperatingly mounted in said first selector slot, and said pin of said valve control post is positioned at the center of said valve aperture of said transverse portion of said cross-type manifold;

wherein said cylindrical selector duct of said cylindrical water temperature control post is located within said oblique groove of said temperature control ring in such a way that said cylindrical selector duct is operatively disposed in said second selector slot of said water temperature control section of said cross-type manifold, for regulating outgoing water temperature by selectively matching said water inlet of said cylindrical water temperature control post with the cool and hot water pipes, and permitting flowing of cool and hot water alone;

wherein said valve control ring cooperatingly engages said water temperature control post, and said valve control ring is operatively connected on said cross-type manifold;

wherein the valve composed of said valve extender, said pliable valve sleeve, said annular connection cover, and said circular tie ring, is operatively connected to the valve-connecting opening of said cross-type manifold; and

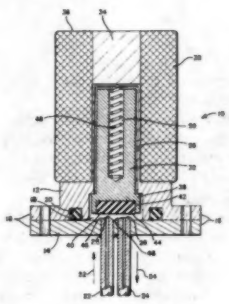
wherein said induction coil is secured at said cross-type manifold in such a way that said metal extending pin is operatively actuating with respect to said water pressure balance duct of said valve extender.

4,681,142

SELF-COMPENSATING SOLENOID VALVE

Fritz H. Woeller, Boulder Creek, and Yutaka Matsumoto, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 7, 1985, Ser. No. 795,945
Int. Cl.[4] F16K *31/02*
U.S. Cl. 137—614.18 **5 Claims**

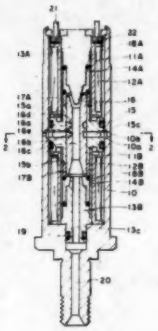


1. A solenoid valve comprising a valve body, a valve chamber in said valve body, first and second fluid passages providing an inlet to said valve chamber and an outlet from said valve chamber, both of said first and second passages being configured to serve bi-directionally and symmetrically as either the inlet or the outlet, resilient means for sealing said first and second passages, a solenoid coil positioned alongside said valve chamber, a movable core positioned within said solenoid coil, said core extending into said valve chamber and being connected to said resilient sealing means, said first and second passages terminating in coplanar ends of the same configuration facing said resilient sealing means so that movement of said core within said solenoid coil moves said resilient sealing means into and out of simultaneous, separate sealing engagement with said first and second passages, and means positioned halfway along said resilient sealing means between the ends of said first and second passages for biasing said resilient sealing means in a given direction with respect to said first and second passages, said core being positioned within said solenoid coil with sufficient clearance and said valve chamber being configured to allow spontaneous alignment of said sealing means with respect to the ends of said first and second passages to make hermetic contact between said sealing means and the one of said first and second passages serving as the outlet by pivoting said core within said solenoid coil.

4,681,143
ELECTROMAGNETIC DIRECTIONAL CONTROL VALVE

Hiroki Sato, Aichi; Yukitomo Sanada, Okazaki; Yuji Yokoya, Toyota; Kazuo Masaki, Chiryu; Kiyohara Nakagawa, Kariya, and Syuuji Murata, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippon Denso Kabushiki Kaisha, both of, Japan

Filed Dec. 24, 1985, Ser. No. 813,144
Claims priority, application Japan, Dec. 27, 1984, 59-273966; Apr. 23, 1985, 60-87095
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—625.37 18 Claims



1. An electromagnetic directional control valve for changing over flow paths of fluid between a first flow path and a second flow path, comprising:

a tubular case having at least one radial hole therethrough;

first and second electromagnetic means fixed in said case and spaced axially from each other;

a tubular core fixed in said case and disposed between said first and second electromagnetic means;

a plunger disposed in said core and operable to move from a neutral position in a first axial direction in response to activation of said first electromagnetic means and from said neutral position in a second axial direction in response to activation of said second electromagnetic means;

a first stopper member bearing against said core and movable together with said plunger at times when said plunger is moved in said first axial direction upon activation of said first electromagnetic means;

a second stopper member bearing against said core and movable together with said plunger at times when said plunger is moved in said second axial direction upon activation of said second electromagnetic means;

valve means movable with said plunger among three valve positions for selectively blocking said hole, connecting said hole to said first flow path, and connecting said hole to said second flow path; and

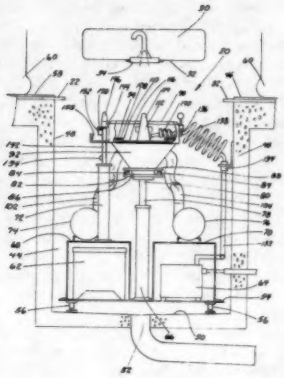
first and second means engaging said first and second stopper members for biasing said plunger toward the neutral position;

said plunger being selectively stopped at said neutral position by said first and second biasing means, at a first stop position against said first biasing means at times when said plunger is moved in said first axial direction upon activation of said first electromagnetic means, and at a second stop position against said second biasing means at times when said plunger is moved in said second axial direction upon activation of said second electromagnetic means, said valve means being in one of said three valve positions at times when said plunger is stopped at each of said neutral position, first stop position, and second stop position.

4,681,144
AUTOMATIC FUELING APPARATUS AND METHOD

Ronald F. Horvath, and Barbara L. Horvath, both of 4325 Kennedy Dr., Apt. 204, Racine, Wis. 53404

Filed Feb. 4, 1986, Ser. No. 825,574
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—1 29 Claims



20. A method for automatic fueling, without manual intervention of a stationary ground-supported vehicle through an inlet on an exposed vehicle tank bottom by means of below-ground apparatus beneath the vehicle comprising:

sensing the vertical position of the tank;

lifting a vertically-movable frame from a retracted below-ground position to an intermediate vertical position fixed by the sensing step, said frame carrying an upwardly-facing nozzle member which is not engaged with the inlet when the frame is in the retracted and intermediate positions;

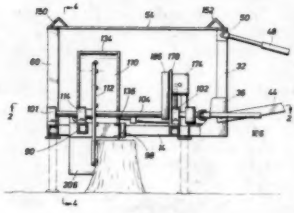
positioning the nozzle member on the frame in vertical alignment with said inlet; and

further lifting the frame until the nozzle member engages the inlet, thereby allowing fueling to proceed.

4,681,145
APPARATUS FOR REMOVING TREE STUMPS

Norman N. York, 61671 Finrock, Pasadena, Tex. 77506

Continuation-in-part of Ser. No. 758,167, Jul. 22, 1985, Pat. No. 4,621,668, which is a continuation-in-part of Ser. No. 581,917, Feb. 21, 1984, Pat. No. 4,530,385. This application Nov. 10, 1986, Ser. No. 928,989
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—2 N 17 Claims



1. Tractor supported and operated stump removal apparatus, comprising:

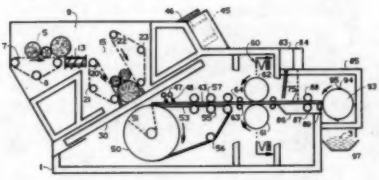
(a) a frame structure adapted to be supported, raised, and lowered by a hitch structure of the tractor;
(b) slide means being positioned for guided reciprocal movement on said frame structure;
(c) hydraulic means for imparting linear reciprocal movement to said slide means, said hydraulic means being independent of tractor hydraulics;
(d) a non-circular drive shaft being mounted for rotary movement on said frame structure and adapted to be driven by the power take-off of the tractor; and
(e) a rotary cutter element being rotatably mounted on said slide means and movable along with said slide means, said rotary cutter element having means providing sliding, non-rotatable relation with said drive shaft, whereby said cutter element is rotated by said drive shaft and is capable of simultaneous linear movement.

4,681,146

METHOD AND APPARATUS FOR PRODUCING ENGINEERED WOOD FLAKES, WAFERS OR STRANDS

Frank F. Liska, and Frank T. Liska, both of, 1403 - 1770 Davie Street, Vancouver, B.C., Canada (V6G 1W4)

Filed Apr. 29, 1985, Ser. No. 728,482
Claims priority, application Canada, May 22, 1984, 454792
Int. Cl.[4] B27L 5/02, 7/00
U.S. Cl. 144—369 10 Claims



1. A method for producing square or rectangular wood flakes from logs of predetermined length, said flakes being square or elongated in the direction of the wood fibers and having clean cut faces and edges, said flakes being of generally uniform predetermined thickness, uniform predetermined width and uniform predetermined length, the edges parallel to the wood fibers forming right, obtuse or acute angles with the face of said flakes and the edges transverse to the wood fibers forming right, obtuse or acute angles with the face of said flakes, the method comprising:

aligning said logs on a log infeed chain conveyor with the fibers of said logs extending transverse to the feed motion,

feeding said logs into a log infeed pocket,

confining said logs tightly in said pocket with three sets of log feeding chains, said chains preventing rolling and lengthwise shifting of said logs and imparting feeding motion to said chains, said chains all moving at the same speed,

presenting the bottom logs confined in said log infeed pocket to the top of a rotary veneer slicing tool containing at least one slicing blade with doublesurfaced nosebars for successive slicing of veneer sheets,

imparting a continual rotary slicing motion to said slicing tool and producing relative feed motion between said log feeding chains and said slicing tool,

compressing the wood fiber of the bottom logs fed by said log feeding chains against the top of said slicing tool, the degree of compression varying gradually from a high compression at the center of rotation of said slicing tool to a low compression at the circumference of said slicing tool,

slicing a veneer sheet from the bottom log during each pass of the slicing blade under said pile of logs, said slicing blade being substantially parallel to the direction of the wood fiber of the log being sliced and the slicing motion direction being substantially transverse to the wood fiber of said logs during the veneer slicing process,

compressing the veneer during slicing from said bottom logs, the degree of compression varying gradually, from a high compression at the center of rotation of said slicing tool to a low compression at the circumference of said slicing tool,

letting the veneers sliced from said logs pass through a recess in the slicing tool and drop onto a rotary veneer assembly drum rotating against the direction of the slicing motion of said slicing tool, towards the veneer strip cutting apparatus, said drum communicating with a source of suction, said veneers being directed by jets of pressurized air and held temporarily on the surface of said veneer assembly drum by the suction in said drum and the pressure exerted by the jets of pressurized air,

imparting motion to said veneer sheets in the direction of the veneer strip cutting apparatus, the wood fiber of said veneer sheets extending parallel to the logs being sliced, parallel to the axis of said veneer assembly drum and transverse to the direction of veneer motion,

transferring said veneer sheets from the veneer assembly drum to a veneer strip cutting apparatus on a set of belts running at a speed corresponding to the circumferential speed of said veneer assembly drum,

holding down the veneer sheets on said set of belts during the transfer to the veneer strip cutting apparatus;

feeding said veneer sheets into a veneer strip cutting apparatus at a speed corresponding to the circumferential speed of said veneer assembly drum,

cutting said veneer sheets transverse to the wood fiber into at least a single veneer strip

continually moving said veneer strips through an edge sealing treatment apparatus at a speed corresponding to the circumferential speed of said veneer assembly drum,

further, continually moving said veneer strips at the speed corresponding to the circumferential speed of said veneer assembly drum through a moisture content and wood mass measuring apparatus towards a rotary flake cutting tool,

imparting cutting motion to said rotary flake cutting tool for successive cutting of the flakes by a plurality of circumferentially distributed cutting blades, the cutting direction extending substantially downwardly, transverse to the direction of travel of said veneer strips, parallel to the fiber of wood.

7. Apparatus for producing square or rectangular flakes from wood logs of predetermined length, said flakes being square in shape like wafers or elongated in the direction of wood fiber like strands, comprising:

a rotary substantially disk shaped veneer slicing tool provided with at least one but preferably several slicing blades with corresponding doublesurfaced nosebars,

means for imparting rotation to said slicing tool,

log infeed pocket disposed above said slicing tool and having means for holding tightly a pile or a single file stack of wood logs and means for presenting the bottommost logs to the top side of said veneer slicing tool, fiber of said logs being extended substantially transversally to the direction of rotation of said rotary veneer slicing tool,

means for conveying and aligning said wood logs before entering said log infeed pocket,

means for producing relative feed motion between said holding means and said rotary veneer slicing tool for causing the latter to slice successive veneer sheets from the bottom of said wood logs and to drop said veneers onto the surface of the hollow rotary veneer assembly drum disposed under said veneer slicing tool and having the axis of said drum extended substantially parallel to the direction of wood fiber of said logs,

means for guiding sliced veneer sheets with jets of pressurized air towards the surface of said veneer assembly drum, said means for guiding being disposed under said veneer slicing tool, above said veneer assembly drum,

means for exerting temporary suction pressure to the surface of said veneers dropped onto the surface of said veneer assembly drum, said suction pressure acting in the direction towards the axis of said veneer assembly drum,

means for cancelling of said negative pressure, separating veneers from the surface of said veneer assembly drum and conveying the veneer sheets towards the veneer strip cutting apparatus,

means for imparting acceleration and conveying motion to said veneers towards said veneer strip cutting apparatus, said motion so correlated to the circumferential speed of said veneer slicing tool as to allow said veneers to follow each other in close succession or in an overlapping mode,

veneer strip cutting apparatus containing rotary veneer strip cutting tools with multiplicity of shearing cutting blades, cutting direction being transversal to wood fiber of said veneers,

means for imparting rotation to said rotary veneer strip cutting tools,

moisture content and wood mass measuring apparatus,

flake cutting apparatus containing rotary flake cutting tool with a plurality of circumferentially distributed cutting edges extending substantially parallel to the axis of said flake cutting tool, mounted to perform cutting motion substantially transversally to the motion of advancing veneer strips and substantially parallel to the wood fiber of said veneer strips,

means for imparting cutting motion to said flake cutting tool, cutting being substantially in downward direction.

4,681,147

SAFETY DEVICE AND TIRE CONSTRUCTION FOR VEHICLES OR OTHER CONTRIVANCES

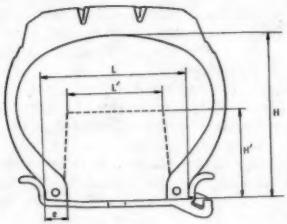
Benoit Hugele, Paris, France, assignor to Hutchinson S.A., Paris, France

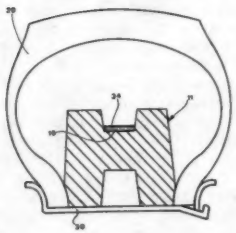
Continuation of Ser. No. 528,797, Sep. 2, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 801,515

Claims priority, application France, Sep. 2, 1982, 82 14998

Int. Cl.[4] **B60C** *17/04, 17/10*

U.S. Cl. 152—158 **4 Claims**





1. A safety device and a tubeless tire construction comprising:

(a) a tubeless tire which is supported by a rim having a width equal to L, said tubeless tire having:
(i) a tread;
(ii) two side walls;
(iii) two beads, the thickness of each of which is equal to e;
(iv) an internal height H; and
(v) a weight P;

(b) a toric safety ring made of elastomer or plastomer, said toric safety ring having:
(i) a rigidity R;
(ii) a SHORE A hardness d;
(iii) a weight P';
(iv) a height H';
(v) a lower portion and an upper portion; and
(vi) a width L' at the top of the upper portion,
the cross-section of said toric safety ring having a symmetrical configuration with respect to a longitudinal median plane of said tubeless tire;

(c) reinforcement means comprising at least one bead core made of elastomer or plastomer of greater hardness than the body of the safety device, said reinforcement means being circumferentially embedded in the lower portion of said toric safety ring; and

(d) a predetermined amount of lubricant interposed between said toric safety ring and said tubeless tire,

wherein the dimensional relationships between said toric safety ring and said tubeless tire are calculated so as to ensure a sufficient internal contact width between said tubeless tire and the upper portion of the safety device to limit the shifting of said tubeless tire in the case of a flat and to give the device a height calculated, with respect to the internal height of said tubeless tire, to avoid a considerable collapse of said tubeless tire and the risk of losing the tread from said tubeless tire, particularly in that:

(e) the width L' is such that:

$$L-3e \leqq L' \leqq L-e;$$

(f) the height H' is such that:

$$\frac{H}{2} + 5\% \leqq H' \leqq \frac{H}{2} + 20\%;$$

(g) the rigidity R is such that:

$$750\ \text{Kg/cm} \leqq R \leqq 1050\ \text{Kg/cm};$$

(h) the weight of the safety device is between 60% and 70% of the weight of said tubeless tire; and

(i) the SHORE A hardness d is such that:

$$70 \leqq d \leqq 80.$$

4,681,148

TIRE DEFLATION MECHANISM

Oscar C. Decker, Jr., 409 Lufberry, Selfridge ANGB, Mich. 48045, and Eugene Kleemann, 17390 Juliana, East Detroit, Mich. 48021

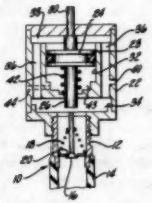
Filed Jul. 27, 1983, Ser. No. 517,601

Int. Cl.[4] **B60C** *23/04;* **F16K** *15/20*

U.S. Cl. 152—431 **2 Claims**

1. In association with a road vehicle having a plurality of wheels equipped with pneumatic tires, each tire having a hollow stem containing a depressible check valve therein for tire-inflation purposes: the improvement comprising a deflator mountable on a stem of each tire on the vehicle, the deflators being collectively used to lower the tire pressures to predetermined low values when it is desired to operate the vehicle on soft terrain; each deflator comprising a hollow body mountable on the associated stem; internal wall structure within the hollow body defining a cylindrical chamber (32); differential area

plunger means (24) within the hollow body located to align with the aforementioned check valve when the hollow body is in its mounted position; said plunger means comprising a piston (28) slidably disposed in said cylindrical chamber, a manually depressible pin (30) extending from one face of the piston outwardly through the hollow body, and a rod (26) extending from the other face of the piston through a wall of the cylindrical chamber and toward the aforementioned check valve: the cross sectional area of the piston being greater than the cross sectional area of the rod; spring means within the cylindrical chamber acting to move the plunger means away from the check valve; and a plurality of air passages (36) within the hollow body operable to transmit pressurized air from the check valve to the cylindrical chamber and thence to said one



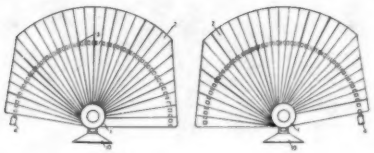
face of the piston; said air passages being spaced radially outward from the cylindrical chamber without going through the plunger means, whereby said one face of the piston is undiminished in area by reason of the passages; said one face of the piston having sufficient area that when the air pressure has a value higher than the predetermined low value the air pressure forces on said one piston face are effective to bias the plunger means to a position wherein the rod holds the check valve open; said spring means being sized so that when the air pressure drops to a predetermined low value the spring means is effective to substantially balance the air pressure forces on the plunger means, whereby the plunger means then offers minimal resistance to movement of the check valve to its closed position.

4,681,149

WINDOW BLINDS FOR VEHICLES

Siu Tung-Chow, New Territories, Hong Kong, assignor to Tai Cheong Blinds Company Ltd., Kwai Chung, Hong Kong

Filed Sep. 19, 1985, Ser. No. 777,493
Int. Cl.[4] B60J *3/00*
U.S. Cl. 160—134 **7 Claims**



1. A window-blind for use in vehicles comprising:

(a) means for removably attaching said window-blind to a window of said vehicle;

(b) a plurality of elongated slats, each of said slats having one end pivotally connected to said attaching means, said plurality of slats being stacked one on top of another when said window-blind is in a closed position, and being opened into a fan-shape when said window-blind is in an open position; and

(c) a connecting tape for connecting adjacent slats to each other and for retaining said window-blind in said fan-shape when said window-blind is in an open position, wherein each slat comprises six apertures, said apertures being spaced across the width of each slat such that a sixth aperture is positioned adjacent to one elongated edge of each slat and five apertures are positioned in a group adjacent a second elongated edge of each slat,

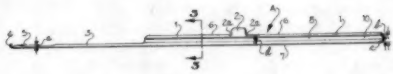
wherein said connecting tape is wound through said apertures such that said tape is inserted from a first side of each slat through said sixth aperture to a second side of each slat, through a fifth aperture back to said first side, thereafter passing over a fourth and a third and a second aperture along said first side, through a first aperture back to said second side, through said second aperture back to said first side, through said third aperture back to said second side, through said fourth aperture back to said first side, and through said fifth aperture, adjacent to itself, back to said second side, and then to a first side of an adjacent slat.

4,681,150

METHOD OF MANUFACTURING STAMPED KNITTING NEEDLES

Masao Fukuhara, Wakayama, Japan, assignor to Fukuhara Needle Company, Ltd., Wakayama, Japan

Division of Ser. No. 850,603, Apr. 11, 1986, Pat. No. 4,625,527.
This application Jul. 25, 1986, Ser. No. 889,177
Claims priority, application Japan, Apr. 12, 1985, 60-79116
Int. Cl.[4] B21G *1/06*
U.S. Cl. 163—5 **5 Claims**



1. A method of manufacturing stamped knitting needles comprising an elongate shank having flat opposite sides and outer and inner edge portions, a hook on one end of said shank, butt means extending outwardly from one edge of said shank, and at least one elongate groove extending longitudinally along at least one of said opposite sides of said elongate shank, said method including the steps of

forming a continuous strip of sheet material of a predetermined width and thickness,

forming a continuous elongate groove along the entire length of at least one side of said strip material and spaced inwardly from one edge thereof to thereby form the groove extending longitudinally along the needle shank, and

then stamping successive needle blanks from said strip material and along at least said one edge of said strip material so that the edge of the strip material forms the back of the needle and the groove extends longitudinally along the shank of the needle.

4,681,151

METHOD FOR PRODUCTION OF FIBER-REINFORCED METAL COMPOSITE MATERIAL

Yoshihiro Koya, Yamato, and Toshiaki Katayama, Yokohama, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

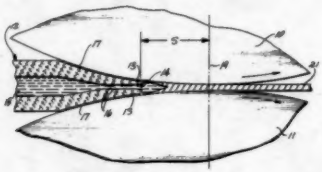
Filed Sep. 26, 1986, Ser. No. 911,878
Claims priority, application Japan, Oct. 22, 1985, 60-235695
Int. Cl.[4] B22D *19/14*
U.S. Cl. 164—76.1 **3 Claims**

1. A method for production of fiber-reinforced metal composite material, characterized by the steps of: impregnating a bundle of fibers with water; then compressing and freezing said water-impregnated fiber bundle to form a high density fiber shaped body; subsequently thawing and drying said high density fiber shaped body, while maintaining its shape as compressed; and thereafter pouring molten metal into said fiber shape body.

4,681,152
CONTINUOUS CASTING ALUMINUM ALLOY

John E. Flowers, Riverside; Christopher A. Romanowski, Lake Arrowhead, and Dennis M. Smith, Crestline, all of Calif., assignors to Hunter Engineering Company, Inc., Riverside, Calif.

Filed Oct. 4, 1985, Ser. No. 783,957
Int. Cl.[4] B22D *11/06, 11/10*
U.S. Cl. 164—477 4 Claims



1. A method for casting an aluminum alloy comprising the steps of continously introducing molten aluminum alloy through an insulating tip to the nip of rotating rolls and continously withdrawing a cast sheet from between the rolls and characterized by the steps of, prior to introducing the molten aluminum alloy to the nip:

sparging a chlorine containing gas from a sparging source into the molten aluminum alloy;

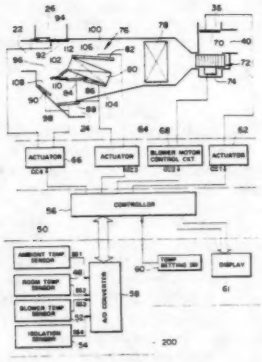
coalescing droplets of chlorides in the molten alloy by passing the molten alloy downstream from the sparging source through a plurality of parallel passages having a width in the range of from 0.5 to 5 millimeters and a length in the range of from five to fifty millimeters; and

filtering any oxide particles from the molten alloy downstream from the passages.

4,681,153
AUTOMOTIVE AIR CONDITIONING SYSTEM WITH INDEPENDENT TEMPERATURE CONTROL FOR DUAL AIR FLOWS

Noriaki Uchida, Yokohama, Japan, assignor to Nissan Shatai Company, Limited, Kanagawa, Japan

Filed Apr. 25, 1984, Ser. No. 603,903
Claims priority, application Japan, May 31, 1983, 58-81265[U]
Int. Cl.[4] B60H *3/00;* B61D *27/00;* F25B *29/00*
U.S. Cl. 165—31 14 Claims



1. An automotive air conditioning system, comprising:

means for cooling inlet air;

means for heating inlet air;

an upper air mix chamber;

a lower air mix chamber;

a first air passage connecting an outlet of said cooling means to said upper air mix chamber for delivering cool air from said cooling means to said upper air mix chamber, said first air passage facing an inlet of said heating means;

a second air passage connecting said cooling means to said lower air mix chamber for delivering cool air from said cooling means to said lower air mix chamber;

a third air passage connecting an outlet of said heating means to said lower air mix chamber for delivering hot air from said heating means to said lower chamber;

a first control means associated with said inlet of said means for heating air for controlling the proportion of said cool air to be delivered through said first passage and to be delivered into said means for heating air;

a second control means associated with said second air passage for controlling the proportion of cool air to be delivered to said lower air mix chamber through said second air passage;

one-way air flow means communicating with said third air passage and including a shutter door for establishing one-way air flow from said third air passage to said upper air mix chamber and for blocking air flow from said upper air mix chamber to said third air passage;

a third control means associated with said outlet of said means for heating air for controlling the delivery of said hot air to said upper air mix chamber through said one-way air flow means and the delivery of hot air to said lower air mix chamber through said third air passage;

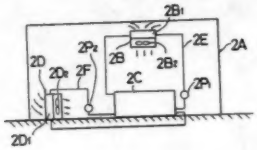
at least one upper air outlet communicating with said upper air mix chamber and adapted to discharge air in said upper air mix chamber to a vehicle compartment; and

at least one lower air outlet communicating with said lower air mix chamber and adapted to discharge air in said lower air mix chamber to said vehicle compartment.

4,681,154
HEAT ACCUMULATING MATERIAL ENCLOSING CONTAINER AND HEAT ACCUMULATING APPARATUS

Naomichi Yano; Hajime Ito, and Shigeru Tanaka, all of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Division of Ser. No. 416,658, Sep. 10, 1982, Pat. No. 4,565,242.
This application Mar. 12, 1985, Ser. No. 710,884
Claims priority, application Japan, Mar. 13, 1981, 56-36131; Aug. 24, 1981, 56-125525; Aug. 24, 1981, 56-133163; PCT Int'l Appl., Mar. 8, 1982, PCT/00063
Int. Cl.[4] F28D *21/00*
U.S. Cl. 165—47 8 Claims



1. A solar heat accumulating greenhouse system, comprising:

greenhouse space defining means enclosing a greenhouse space comprising a major volume of air for exchanging heat,

a first heat transfer fluid medium circulating system provided in said greenhouse space and comprising piping means for circulating a first heat transfer fluid medium

heat exchange means provided in an uppermost portion of said greenhouse space and coupled to said first heat transfer fluid medium circulating system for exchanging heat

between said first heat transfer fluid medium and said major volume of air circulated within said greenhouse space, and

heat accumulating means coupled to said first heat transfer fluid medium circulating system for exchanging heat between said first heat transfer fluid medium and said heat accumulating means for accumulating heat,

said heat accumulating means comprising:

heat insulating tank means coupled to said first heat transfer fluid medium circulating system for defining a heat insulated space for allowing a flow therethrough of said first heat transfer fluid medium,

heat accumulating capsule means containing a phase transforming heat accumulating medium and provided in said heat insulating tank means in contact with said first heat transfer fluid medium for accumulating heat, and

flow path defining means provided in said heat insulating tank means for defining a flow path generally extending in a horizontal direction and for causing a change in the flow direction of said first heat transfer fluid medium in upward and downward directions,

said flow path defining means comprising

partitioning means for partitioning the space in said heat insulating tank means into a plurality of compartments disposed in succession along the upstream to downstream direction of said flow of said first heat transfer fluid medium, and

passage means for directing said flow of said first heat transfer fluid medium from the lower portion of an upstream compartment to the upper portion of the next adjacent downstream compartment; and wherein

a portion of said piping means for flow of said first heat transfer fluid medium into said heat accumulating means is coupled to an upper portion of an upstream compartment, and a portion of said piping means for flow of said first heat transfer fluid medium out of said heat accumulating means is connected to a lower portion of a downstream compartment,

said heat accumulating capsule means is adapted to extend through said partitioning means into a plurality of compartments and each said partitioning means is split into upper and lower partitioning means elements at a position where a heat accumulating capsule means extends therethrough.

4,681,155

LIGHTWEIGHT, COMPACT HEAT EXCHANGER

Theodore A. Kredo, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 1, 1986, Ser. No. 858,481
Int. Cl.[4] F28F *3/00*
U.S. Cl. 165—76 **8 Claims**

5. A heat exchanger comprising:

a plurality of tubes defining a plurality of first flow paths;

a plurality of pairs of generally C-shaped bars spacing said plurality of tubes apart from adjacent tubes, said bars extending generally perpendicular to said plurality of tubes and each pair of bars defining a plurality of second flow paths;

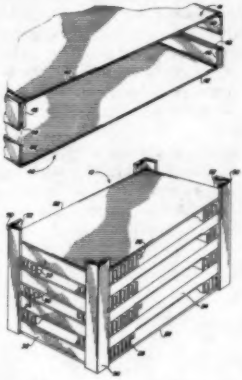
an extended surface heat transfer element between each pair of bars;

an integral lanced tab formed at each end of said bars, each tab folded over itself toward the heat exchanger center and capturing a portion of said extended surface heat transfer element between itself and said bar;

side plates on each side of said heat exchanger, said side plate spaced from one of said tubes by a pair of bars;

means for securing said tubes, bars, extended surface heat transfer elements and side plates together; and

manifold means, sealingly attached to said tube ends for distributing a working fluid into said plurality of first flow



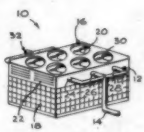
paths at one end of said tubes and for selecting said working fluid at the opposite end of said tubes.

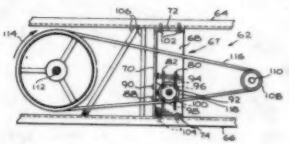
4,681,156

COOLING APPARATUS FOR A GAS TRANSMISSION SYSTEM

Paul A. Leonard, 3829 Lees Ave., Long Beach, Calif. 90808

Filed Sep. 10, 1986, Ser. No. 906,270
Int. Cl.[4] F28F *13/12*
U.S. Cl. 165—124 **5 Claims**





1. Improved cooling apparatus for a gas transmission system, including:

input means for receiving a medium to be cooled;

output means for transmitting said medium after it is cooled; and,

cooling means intercoupling said input means and said output means, said cooling means including radiator means having an input end and an output end, said input end of said radiator means being connected to said input means and said output end of said radiator means being connected to said output means;

said cooling means including, in addition, fan means positioned to cooperate with said radiator means for producing a flow of cooling air across said radiator means;

said fan means including a rotatable fan having a desired direction of rotation, a drive-motor for driving said fan in said desired direction and belt means intercoupling said drive-motor and said rotatable fan for rotation of said fan;

said belt means including a belt having, alternatively, a taut state and a slack state, and adjustable belt-tensioning

means including a frame and being mechanically coupled to said belt for tensioning said belt between said taut state and said slack state, said adjustable belt-tensioning means including a sheave in rotating contact with said belt, a shaft having first and second ends, carrying said sheave at the first end thereof, and positioned in said frame substantially parallel to the plane of said belt and spaced from said belt an adjustable distance corresponding to the condition desired for said belt between said taut state and said slack state;

a sprag-clutch having a first race fixedly connected to said frame and a unidirectionally rotatable second race coupled to said second end of said shaft, said second race having a direction of rotation relative to said first race which corresponds to said desired direction of rotation of said fan.

4,681,157

CROSSFLOW HEAT EXCHANGER

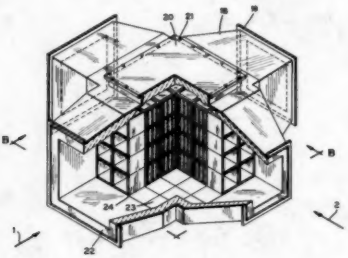
Hans-Dieter Schwarz; Friedrich W. Pietzarka; Werner Lichtenthaler, and Ludwig Muhlhaus, all of Dortmund, Fed. Rep. of Germany, assignors to Uhde GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,141

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435911

Int. Cl.[4] F28F 9/22; F28D 7/02

U.S. Cl. 165—145 **5 Claims**



1. A crossflow heat exchanger, comprising:

(a) a body with two gas inlet and two gas outlet nozzles,

(b) at least one installation cover on the upper side of the body,

(c) a block consisting of a number of ceramic heat-exchange elements mounted completely accurately in a cuboid form with gas ducts layered above one another at right angles to one another, four external side surfaces having gas-duct openings, and the bottom and top surfaces being free of openings,

(d) thermal insulation between the body and the block of ceramic heat-exchange elements,

(e) elevations and recesses on all peripheral edges of each said side surface of each heat-exchange element, whereby opposing heat-exchange elements fit into one another and the side surfaces are not in contact in the gas-duct area, so that a flat hollow chamber is porduced between adjacent heat-exchange elements,

(f) a sealing-strip is fitted between each opposing elevation and recess, and

(g) at least one recess or elevation on the bottom and top surfaces of each heat-exchange element, the elements locking positively into one another as said recesses and elevations cooperate with one another.

4,681,158

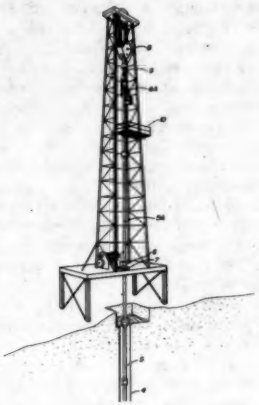
CASING ALIGNMENT TOOL

Harold P. Pennison, New Orleans, La., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 433,307, Oct. 7, 1982, abandoned. This application Mar. 13, 1986, Ser. No. 839,470

Int. Cl.[4] E21B 19/00

U.S. Cl. 166—77.5 **1 Claim**



1. A casing alignment tool for aligning one section of casing within a derrick of a drilling rig positioned over a wellbore with another section of casing extending from said wellbore, said tool comprising:

a frame mounted in said derrick at a point adjacent the upper portion of said one section of casing:

a head assembly pivotably mounted to said frame, said head assembly comprising:

a yoke member having a recess in one end to receive said one section of casing;

means for pivotably connecting the other end of said yoke to said frame for movement about a horizontal axis;

means for rotating said yoke about said horizontal axis between a retracted position substantially parallel to have the vertical axis of said derrick and an operable position substantially perpendicular to the vertical axis of said derrick;

a plurality of roller means rotatably mounted on said yoke and extending into said recess whereby said roller means will engage said one section of casing when said casing is received in said recess;

a pair of roller arm assemblies being pivotably mounted on said yoke at respective sides of said recess;

means for moving each of said roller arm assemblies between an open position where said recess is free to receive said one section of casing and a closed position when said one section of casing will be held in said recess; each of said means for moving said roller arm assemblies comprising:

a power cylinder mounted on said yoke;

a rod operated by said power cylinder; and

a plurality of spaced holes in said one end of each respective roller arm assembly whereby said respective rod can be selectively connected to one of said holes to thereby adjust said head assembly to receive casing havings different diameters;

roller means rotatably mounted on each roller arm assembly and positioned to extend into said recess to engage said one section of casing when said roller arm assemblies are in a closed position, said plurality of roller means on said yoke and said roller arm assemblies positioned so that the centerpoint of a circle passing through the axes of said

roller means when said arm assemblies are in a closed position will be on the centerline of said wellbore; and

wherein said means for pivotably connecting the other end of said yoke to said frame further includes:

a plurality of holes in said frame whereby one of said holes is aligned with a hole in said yoke to thereby adjustably position the centerpoint of said roller means with said centerline of said wellbore.

4,681,159

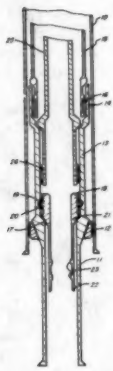
SETTING TOOL FOR A WELL TOOL

Roger P. Allwin, and Mark Budke, both of Bryan, Tex., assignors to MWL Tool Company, Midland, Tex.

Filed Dec. 18, 1985, Ser. No. 810,100

Int. Cl.[4] E21B *23/00*

U.S. Cl. 166—124 **9 Claims**



1. A setting tool for use in a well bore with a well tool requiring a longitudinal motion for operation including,

telescopically mounted upper and lower tubular members, said upper tubular member being adapted for coupling to a tubing string, said lower tubular member being longitudinally movable from a first upper position to a second lower position with respect to said upper tubular member,

a first outer releasable interconnecting nut means for threadably interconnecting said upper tubular member to a well tool, said first releasable interconnecting nut means being slidably but non-rotatively mounted on said upper tubular member for permitting relative longitudinal motion between said upper tubular member and said first interconnecting nut means and for permitting co-rotation of said upper tubular member and said first nut means for releasing said first nut means from a well tool,

a second outer releasable interconnecting nut means for threadably interconnecting said upper tubular member to a well tool, said second releasable interconnecting nut means being arranged for non-rotative releasable interconnection to a well tool for permitting upper tubular member to be releasable from interconnection with said second interconnecting nut means upon rotation of said upper tubular member relative to a well tool,

said lower tubular member having an internal valve seat adapted for sealingly receiving a sealing means dropped through a tubing string so that hydraulic pressure can be applied for moving said lower tubular member between said first and second positions,

said upper and lower tubular members being arranged so that said upper tubular member has a downwardly facing surface which is engagable with an upwardly facing surface on said lower member so that upon release from the threaded interconnection of said second interconnecting nut means, said upper tubular member can engage said lower member for longitudinally moving said lower tubular member conjunctively with said upper tubular member.

4,681,160

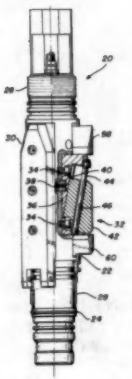
APPARATUS FOR SECURING A MEASUREMENT-WHILE-DRILLING (MWD) INSTRUMENT WITHIN A PIPE

Douglas H. Fineberg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1985, Ser. No. 797,275

Int. Cl.[4] E21B *23/00, 23/04*

U.S. Cl. 166—212 **8 Claims**



1. Apparatus for mounting an instrument within a tubular member comprising:

an elongated body member for attachment to said instrument;

a plurality of fixed contact pad members mounted to said body member; and

a pressure responsive slidable contact pad member mounted to said body member, said pressure responsive contact pad member responsive to a pressure increase within the annulus of said tubular member, said pressure responsive contact pad member comprising a base member rigidly mounted to said body member said base member having an inclined plane surface and a generally wedge shaped contact pad member slidably retained within said base member for translational movement along said inclined plane surface for radial displacement of said wedged shaped contact pad member.

4,681,161

WELL SCREEN CENTRALIZER AND METHOD FOR CONSTRUCTING CENTRALIZER AND FOR JOINING OF WELL SCREENS

Bryant A. Arterbury, and James E. Spangler, both of Houston, Tex., assignors to Howard Smith Screen Company, Houston, Tex.

Filed Mar. 17, 1986, Ser. No. 839,955

Int. Cl.[4] E21B *17/10*; E03B *3/18*

U.S. Cl. 166—227 **6 Claims**

1. A well screen centralizer with a longitudinal flowpath therethrough connectable in a well screen to become a part thereof, comprising:

a. a body comprising:

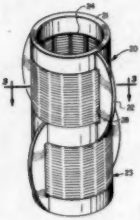
(i) a plurality of ring members axially aligned and spaced apart;

(ii) a plurality of circumferentially spaced, longitudinally

extending centralizer blades connecting adjacent ring members together, said blades being structurally rigid and unyielding in response to radially directed forces applied to said blades; and,

b. well screen insert means filling the spaces between adjacent ring members.

5. A method of constructing a well screen centralizer comprising the steps of:



a. aligning a plurality of ring members in axial relation, connecting adjacent ring members together with circumferentially spaced, longitudinally extending centralizer blades; and

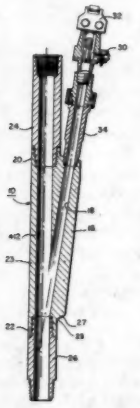
b. securing well screen inserts between adjacent ring members.

4,681,162

BOREHOLE DRILL PIPE CONTINUOUS SIDE ENTRY OR EXIT APPARATUS AND METHOD

Harper Boyd, Lake Charles, La., assignor to Boyd's Bit Service, Inc., Lake Charles, La.

Filed Feb. 19, 1986, Ser. No. 830,824
Int. Cl.[4] E21B *17/00, 19/08*
U.S. Cl. 166—242 **1 Claim**



1. A side entry sub for use in combination with a hydraulic pressure pack-off assembly for freeing a stuck drill pipe of a drill pipe string without disassembly of a top drive drilling motor assembly which comprises:

a main body section;

a main passage through said main body section off-center with respect to the center line of said main body section and of the same diameter as the inside diameter of said drill pipe; said main passage having upper and lower ends, said upper and lower ends provided with internal female pipe threads,

a side entry passage in said main body section which intercepts said main passage and extends in the same direction as said main passage at an angle of about 6½ degrees relative to said main passage and of a smaller diameter than said main passage, said side entry passage having an outer end with internal female pipe threads,

a short pipe section having a length of from about 17 inches to about 20 inches secured to each pipe threaded end of said main passage in said main body section in which said short pipe section includes pipe threads on the outer surface of each end to assume a greater amount of wear during use than said main body section and which is replaceable when worn, and

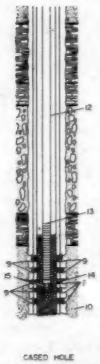
an adapter having male pipe threads on its outer end surfaces secured to said side entry passage and to which said hydraulic pressure pack-off assembly is secured.

4,681,163

SAND CONTROL SYSTEM

John P. Guidry, Sugar Land, and Lee Roy C. Gavranovic, Guy, both of Tex., assignors to Well Improvement Specialists, Inc., Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 797,109
Int. Cl.[4] E21B *43/04, 43/10*
U.S. Cl. 166—278 **6 Claims**



1. A method for controlling sands in a wellbore, the method comprising the steps of

introducing an amount of particles into the wellbore,

introducing a tubular string into the particles and moving the string downwardly in the particles, the tubular string having swivel means for rotatably connecting an entry tool to the string, the swivel means connected between the string and the entry tool, the swivel means having a diameter no greater than the diameter of the string, the entry tool mounted to the swivel means for relative rotation therewith, the tool having auger means thereon for facilitating the introduction of the string into the particles.

4. A tool for facilitating the introduction of a tubular string into an accumulation of particles in a wellbore having perforations for production, the tool comprising

body means,

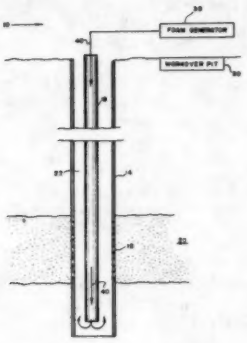
rotative connection means for rotatably connecting the body means to the string for relative rotation therewith, the rotative connection means connected between the string and the body means and having a diameter no greater than the diameter of the string, and

auger means connected to the body means for augering into the particles and for facilitating the movement of particles into the perforations.

4,681,164
METHOD OF TREATING WELLS WITH AQUEOUS FOAM

Ronald R. Stacks, 4200 Crestgate, Midland, Tex. 79707

Filed May 30, 1986, Ser. No. 869,018
Int. Cl.[4] E21B *37/08, 43/25, 43/27*
U.S. Cl. 166—304 8 Claims



1. A method of treating a hydrocarbon producing well utilizing foam injection, comprising the steps of:

circulating the foam up the well to remove substantially all fluids and loose solids from the well;

dissolving substantially all liquid and solid hydrocarbons left in the well at a formation level;

circulating a mixture of foam and mineral acid up the well to remove ferrous salts and calcium carbonate;

removing calcium sulfate from the well by injecting a calcium sulfate converter to cover the face of the well at the formation level;

removing the converted calcium sulfate by a flow of foam which comprises a mixture of 0.5–2% of solvent, 0.25–2% of corrosion inhibitor and 96–99.25% of water; and

circulating a mixture of foam, mineral acid and iron chelator up the well to remove substantially all residue left in the well.

4,681,165
AQUEOUS CHEMICAL WASH COMPOSITIONS

Charles E. Bannister, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Mar. 1, 1984, Ser. No. 585,061
Int. Cl.[4] E21B *33/05;* C09K *7/02*
U.S. Cl. 166—312 16 Claims

1. An aqueous, substantially unfoamed chemical wash composition having properties making it suitable for use as a preflush in well cementing operations and/or for removal of drilling mud from a borehole at a temperature of from about 150° F. to about 270° F., said wash

a. being predominately composed of water,

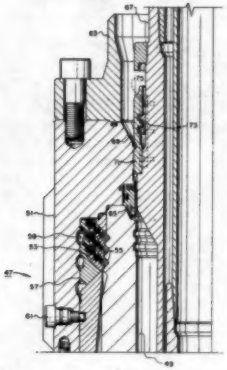
b. containing an active surfactant component comprising a combination of (1) from about 0.1 to about 1.5 weight percent (total weight basis) of a water soluble anionic surfactant; (2) from about 0.1 to about 1.5 weight percent (total weight basis) of a nonionic surfactant; and (3) from about 0.05 to about 0.54 weight percent (total weight basis) of at least one water soluble amphoteric surfactant, and

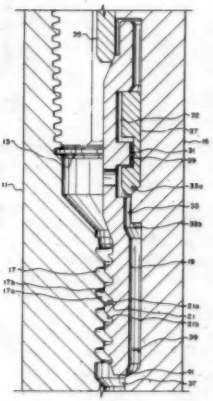
c. having dispersed therein a heterogeneous mixture of distinct particles comprising both a first particulate oil soluble resin which is friable and a second particulate oil soluble resin which is pliable and wherein the size of said friable resin particles ranges from about 0.5 to about 300 microns and the size of said pliable resin particles ranges from about 0.05 to about 30 microns, the amount of said friable-pliable resin mixture being sufficient to impart effective fluid loss control to said chemical wash composition.

4,681,166
INTERNAL NONROTATING TIE-BACK CONNECTOR

Glen H. Culper, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Aug. 18, 1986, Ser. No. 897,431
Int. Cl.[4] E21B *33/038*
U.S. Cl. 166—345 3 Claims





1. A tie-back connection apparatus for securing the lower end of an inner conduit into an outer conduit of a subsea wellhead, the inner conduit extending upwardly from the wellhead and being held in tension, the apparatus comprising in combination:

a set of threads formed on an inner wall of the outer conduit;

an annular latch carried by the inner conduit, the latch having a set of threads on its exterior for engaging the threads in the outer conduit, the threads of the latch being resiliently contractible in a radial direction;

means on the inner conduit for allowing the latch threads to deflect inwardly to slidingly ratchet past the outer conduit threads while the inner conduit is in a lower position relative to the latch and as the inner conduit is lowered without rotation into the outer conduit;

means for preventing the latch threads from deflecting inwardly when the inner conduit is subsequently moved upwardly relative to the latch to an upper position, for securing the inner conduit to the outer conduit against upward movement; and

retaining means cooperating with the latch and the inner conduit for preventing after the inner conduit has moved to the upper position subsequent downward movement of the inner conduit relative to the latch and outer conduit, and for transmitting a downward load on the inner conduit through the retaining means to the latch, and through the threads of the latch to the outer conduit;

the engaging threads allowing removal of the inner conduit from the outer conduit by rotation of the inner conduit.

4,681,167

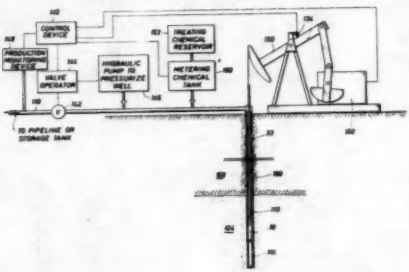
APPARATUS AND METHOD FOR AUTOMATICALLY AND PERIODICALLY INTRODUCING A FLUID INTO A PRODUCING OIL WELL

Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 618,469, Jun. 8, 1984. This application May 17, 1985, Ser. No. 735,382

Int. Cl.[4] E21B *43/00, 37/06, 34/10, 34/14*

U.S. Cl. 166—371 **17 Claims**



1. A method for periodically and automatically introducing a fluid into a producing well through a tubing drain valve in a string of production tubing, comprising:

disabling temporarily, automatically and at periodic time intervals a string of sucker rods disposed within said string of production tubing between a surface-located means for operating said sucker rods and a downhole pump so that a mechanical actuator on said string of sucker rods is stopped in a predetermined position on one side of a lever means of said tubing drain valve;

opening said tubing drain valve by pressurizing the interior of said production tubing to a pressure sufficient to actuate said tubing drain valve to its opened position;

introducing a fluid into said production tubing in response to the opening of said tubing drain valve;

conveying said introduced fluid into said producing well through said tubing drain valve;

enabling said string of sucker rods; and

closing said tubing drain valve by moving said lever means on said valve with said mechanical actuator as a result of the enablement of said string of sucker rods.

14. An apparatus useful for periodically and automatically introducing a fluid into a producing well through a tubing drain valve located in a production string, comprising:

a string of production tubing suitable for suspension in a producing well;

surface and downhole pumps connected by a string of sucker rods for lifting well fluids through said production tubing;

a tubing drain valve within said production string, said tubing drain valve actuated to its opened position by increased pressure within said production tubing and actuated to its closed position by movement of a lever means of said value;

means in communication with the interior of said production tubing for pressurizing said production tubing to a pressure sufficient to open said tubing drain valve;

means in communication with the interior of said production tubing for introducing a fluid into said production tubing;

an actuator means disposed on said string of sucker rods for mechanically closing said tubing drain valve by cooperation with said lever means on said valve; and

means for controlling automatically the operation of the above components at periodic time intervals for automatically conveying a fluid into said production tubing and through said tubing drain valve.

4,681,168

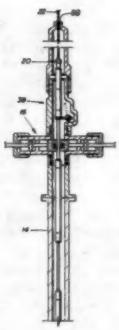
METHOD AND APPARATUS FOR RUNNING LONG TOOLS INTO AND OUT OF A PRESSURIZED ENCLOSURE

James W. Kisling, III, Kingwood, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,755

Int. Cl.[4] E21B *23/00*

U.S. Cl. 166—381 **5 Claims**



1. An apparatus for inserting and withdrawing an elongated tool, formed by a plurality of uniform sections of a first diameter joined by connectors of a second smaller diameter, into and out of a producing well closed by a blowout preventer, said apparatus comprising:

a housing secured by one end to an upper end of said blowout preventer and defining a through bore forming an axial extension of a bore of said blowout preventer,

a cavity opening inwardly into the bore of said housing,

a plate mounted by a first side in said cavity movable between a first position extending from said cavity substantially blocking said bore and a second position lying within said cavity substantially freeing said bore of any obstruction;

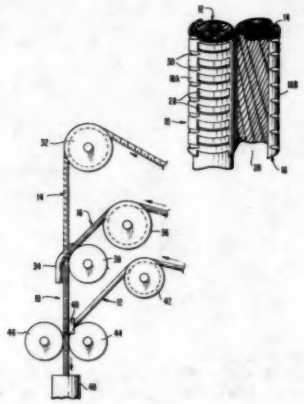
a slot extending from a second side of said plate opposite said first side radially across at least the center of said plate, said slot being wider than said second diameter and narrower than said first diameter; and

a pressure tight container adapted to be secured to the other end of said housing whereby tool segments, formed by a section and a connector, are assembled on said housing, enclosed in said container and, by opening said blowout preventer and moving said plate from the first to the second position, sequentially lowered into said well with said plate returning to said first position to engage said connector thereby holding said tool, and said tool is withdrawn from said well by reversing the process.

4,681,169
APPARATUS AND METHOD FOR SUPPLYING ELECTRIC POWER TO CABLE SUSPENDED SUBMERGIBLE PUMPS

Earl B. Brookbank, III, Bartlesville, Okla., assignor to TRW, Inc., Cleveland, Ohio

Filed Jul. 2, 1986, Ser. No. 881,245
Int. Cl.[4] E21B *41/00, 19/00;* H02G *1/00;* H01B *7/18*
U.S. Cl. 166—385 7 Claims



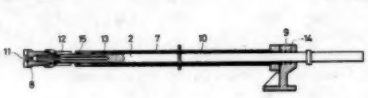
1. A method of supporting and electrically energizing equipment in a well, that comprises providing a continuous length of electrical power cable, providing a continuous length of support cable, providing a continuous length of cable carrier, feeding said continuous lengths toward the well, continuously joining said cable carrier with said power cable and with said support cable to form a unitary assembly as said lengths are advanced toward said well, and feeding said unitary assembly into said well.

5. A cable assembly comprising a continuous length of electrical power cable, a continuous length of support cable, and a continous length of cable carrier substantially coextensive longitudinally with said cables, said cable carrier comprising two laterally displaced resilient clamping sections open at opposite sides of the carrier, one of said sections resiliently embracing one of said cables and the other of said sections resiliently embracing the other of said cables.

4,681,170
ROCK DRILLS FOR DRILLING CONTINUOUSLY ARRAYED BORES

Toshio Ohi, Takasaki, Japan, assignor to Furukawa Co., Ltd., Tokyo and Okumura Corporation, Osaka, both of, Japan

Filed Aug. 5, 1985, Ser. No. 762,528
Int. Cl.[4] E21C *3/00*
U.S. Cl. 173—50 2 Claims



1. A rock drill for drilling a plurality of arrayed continuous bores comprising:

a plurality of rods positioned for drilling a plurality of arrayed continuous bores;

a rotating means for imparting rotation to said rods;

a single percussion member for imparting percussive force to said plurality of rods; and

a rod guide which the plurality of rods are passed through and held within including a plurality of cylindrical tubular members integrally combined, each one thereof corresponding to one of the plurality of rods, wherein each of said plurality of rods is passed through its corresponding tubular member so as to hold and guide the plurality of rods for substantially their entire length and to provide a fluid passage for flushing fluid formed between an outer surface of each of the plurality of rod members and an inner surface of the corresponding tubular member.

4,681,171
ONE-PERSON BATTERING RAM

Gene A. Kee, 49 Harmon St., and Mark Hanna, 50 Sterling St., both of, West Lynn, Mass. 01905

Filed Jul. 12, 1985, Ser. No. 754,476
Int. Cl.[4] B25D *9/00;* A63B *59/00*
U.S. Cl. 173—90 5 Claims

2. A battering ram suitable for use by one person in battering an object, the battering ram comprising:

(a) a substantially solid body having a longitudinal axis, a length along such axis, and first and second opposing ends through which such axis passes, having a weight in excess of ten pounds but insufficient to prevent its being carried by one person;

(b) a first handle attached to the body proximate to the location of the center of gravity of the body along its longitudinal axis, to allow the user to hold the body and to swing it along its longitudinal axis with sufficient ease to generate momentum for battering the object, wherein the handle projects radially outwardly from the body a distance substantially less than the length of the body,

the first handle including a cable threaded through spaced holes in the tube in such a way as to cause a loop of such cable to protrude outwardly from the tube, the portion of such cable within the tube being embedded in concrete;

(c) a second handle attached to the body at the second end thereof; and

(d) a contact face, disposed at the first end of the body, for making physical contact with the object, the contact face having sufficient compressive strength and resilience as not to crack or shatter upon repeated heavy blows against the object.

4,681,172
CUSHIONING DEVICE FOR USE WITH A PNEUMATIC IMPACT TOOL OR THE LIKE

Toshio Mikiya; Minoru Kaneko, and Yasuo Kazama, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,228
Claims priority, application Japan, Oct. 12, 1984, 59-212476
Int. Cl.[4] B25D *17/24*
U.S. Cl. 173—139 3 Claims

1. A cushioning device for a pneumatic impact tool or the like having an impact means such as a chisel and a housing means provided with first exhaust hole means opening to the atmosphere, said device comprising:

a rear cylinder closed at its front and rear ends and having air inlet port means and air port means in communication with the interior of the cylinder;

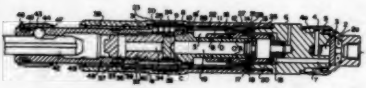
a front cylinder interconnected concentrically with the rear cylinder and closed at its rear end by the closed front end of the rear cylinder, said rear and front cylinders being axially slidably mounted in said housing means;

a piston mounted in the front cylinder for reciprocal sliding movement between the front closed end of the rear cylinder and said impact means;

a first outer cylindrical sleeve mounted over and coaxilly with the rear cylinder and within the housing means, the sleeve including an air outlet port means opening to said air space and communicable with said air port means;

a second outer cylindrical sleeve mounted over and coaxially with the front cylinder, the second outer cylindrical sleeve having second exhaust hole means communicable with said first exhaust hole means; and

an air space defined at least in part by the end face of one of the rear cylinder and the front cylinder, a first outer cylindrical sleeve mounted over the rear cylinder, and a second cylindrical sleeve interposed between said cylinders and said housing means, said first outer cylindrical sleeve



having air outlet port means opening to said air space and communicable with said air port means, said second cylindrical sleeve having second exhaust hole means communicable with said first exhaust hole means;

said first and second exhaust holes, said air inlet port means and said air outlet port means being arranged such that as the rear and front cylinders are moved backward due to reaction forces exerted on the piston when the impact means strikes a workpiece to reduce the volume of the air space, the air in the air space is initially discharged through the second and first exhaust hole means to the atmosphere until the second exhaust hole means is closed by the front cylinder whereafter the air pressure in the space is increased to cushion the rearward movement of the cylinders and such that continued rearward movement of the cylinders brings the air inlet port means into alignment with the air outlet port means to permit the air in the space to escape through the aligned port means into the interior of the rear cylinder so that the air in the space continues to perform the cushioning function in a self-controlled manner.

4,681,173

METHOD AND APPARATUS FOR DRILLING A GROUP OF SUBSEA WELLS

Brennan C. Disher, and Steven H. Tate, both of Morgan City, La., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 19, 1985, Ser. No. 756,544
Int. Cl.[4] E21B *7/128*
U.S. Cl. 175—7 **3 Claims**

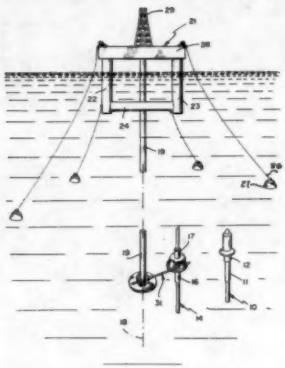
1. The combination with a first well drilled into the floor of an offshore body of water and having a first drill pipe (16) protruding upwardly therefrom, of a pipe guide for commencing a second well into said ocean floor at a predetermined distance and direction from said first well and comprising

a clamping head (32) adapted for removable engagement with said first drill pipe (16) and operable to be selectively rotatably adjusted or fastened on said drill pipe,

a drill pipe sleeve guide having a skirt at the lower end thereof for resting on the ocean floor, and defining a vertical opening for slidably registering a second drill pipe to position the latter for entry into the ocean floor at said predetermined distance from said first well,

a spacer bar (39) depending from said drill pipe sleeve guide (36) and extending outwardly therefrom in a direction normal to said vertical opening,

a spacer bar clamp (58) including at least two clamp members which depend from a side of said clamping head and define therebetween a generally horizontal passage for slidably receiving said spacer bar,



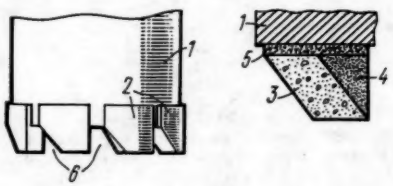
said spacer bar clamp (58) being operable to fixedly engage a segment of said spacer bar (39) when said drill pipe sleeve is positioned said predetermined distance from said first well whereby to fixedly establish said predetermined distance and direction.

4,681,174

DIAMOND CROWN BIT

Marat T. Aubakirov; Esengali L. Limanov; Askar K. Syzdykov; Ravil S. Abdrazakov; Murat G. Tleuov, all of Alma-Ata; Vladimir S. Khazhuer, Terek; Ruslan D. Buzdov, Nalchik, and Vladislav K. Khashirov, Terek, all of U.S.S.R., assignors to Kazakhsky Politekhnichesky Institute Imeni V.I. Lenina, Alma-Ata, U.S.S.R.

Filed Jan. 16, 1986, Ser. No. 819,522
Int. Cl.[4] E21B *10/48*
U.S. Cl. 175—330 **1 Claim**



1. A diamond crown bit, comprising:

a body;

a matrix secured on one of the end faces of said body;

mud discharge ports subdividing said matrix into sections separated from one another;

each said sector consisting of:

a weld-on layer on said one end face of said body whereby said sectors are held to said body;

a diamond-impregnated layer shaped as a parelleleipiped and held to said weld-on layer to have its front and rear faces inclined; and

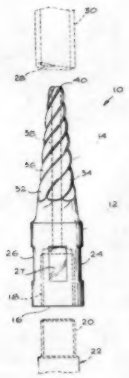
an insert shaped as a triangular prism having side face rigidly held to the weld-on layer and its face face rigidly held to the inclined rear face of the diamond-impregnated layer.

4,681,175

AUTO-COUPLING TOOL FOR DRILL-PIPES

Bruce Bocking, 550 E. Foothill Blvd., Glendora, Calif. 91740; Joe A. Cervantes, Jr., 265 Kirkwall Rd., Azusa, Calif. 91702; Douglas H. Green, 16740 Bygrove, Covina, Calif. 91722; Bruce W. La Sota, 1425 S. Almansor, Alhambra, Calif. 91801; David H. Marshall, 1621 Bramhall, Glendora, Calif. 91740; Bernard Rodriguez, 3828 Baldwin Park Blvd., Baldwin Park, Calif. 91706, and Glen Van Gorden, 308 E. Shorb St., Alhambra, Calif. 91801

Filed Oct. 5, 1984, Ser. No. 658,044
Int. Cl.[4] E21B 7/20
U.S. Cl. 175—393 1 Claim



1. A tool for use in installing utility pipes in the ground, including:

a unitary body;

said unitary body having a coupling portion and a bit portion;

said coupling portion having a hollow region therein, said hollow region bearing threads on the inner wall thereof, said threads being sized and shaped to receive the male threads on a first utility-pipe section;

said bit portion being rigid and being coaxial with said coupling portion, and said bit portion being tapered, and having its narrow end remote from said coupling portion and bearing, on the outer surface thereof, in coaxial relationship with said bit portion, a plurality of intertwined, spirally-disposed, sharp ridges for engaging the inner wall of a second utility-pipe section to cause such second utility-pipe section to rotate in unison with said first utility-pipe section;

said bore-pipe coupling tool including, in addition, an axial passageway extending from said hollow region of said coupling portion through the entire length of said bit portion, whereby debris accumulating around narrow end of said tool may be flushed out by the introduction of water under pressure into said axial passageway in said bit portion, thus facilitating the movement of the tool through the ground;

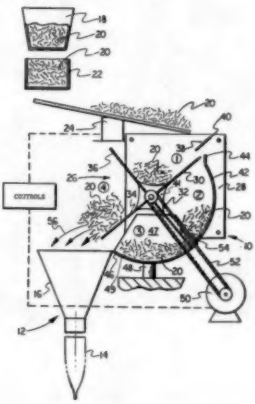
said coupling portion bearing opposed flat outer surfaces thereon.

4,681,176

PRODUCT HANDLING AND WEIGHING APPARATUS

Michael J. Moran, Raleigh, and Tadeusz Kemnitz, Durham, both of N.C., assignors to 501 USM Corporation, Farmington, Conn.

Filed Aug. 1, 1986, Ser. No. 892,669
Int. Cl.[4] G01G 13/24, 19/00
U.S. Cl. 177—114 7 Claims



1. A product handling and weighing apparatus comprising:

a. a weighing bucket having a smooth concave bottom and upstanding side walls;

b. a paddle wheel having spaced interconnected vanes forming product pockets therebetween; and

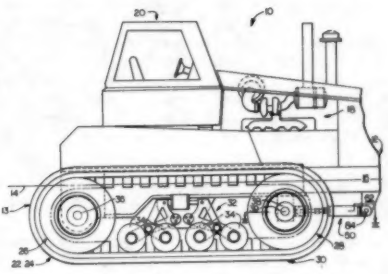
c. a concave backing member adjacent said weighing bucket and coacting with said vanes to form a holding pocket for the product prior to entry into the weighing bucket.

4,681,177

METHOD AND APPARATUS FOR TENSIONING FRICTIONALLY DRIVEN, GROUND ENGAGING BELTS

David G. Zborowski, Bettendorf, Iowa, assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 9, 1985, Ser. No. 806,918
Int. Cl.[4] B62D 55/30
U.S. Cl. 180—9.56 21 Claims



1. A belt laying work vehicle comprising:

a main frame having a longitudinal axis;

a laterally extending rigid axle having an axis of rotation;

a pair of longitudinally separated wheel structures disposed on each lateral side of and in supporting relation to said main frame, a first wheel structure of each pair being

mounted on opposite ends of said axle and constrained to rotate about the axis of rotation;

an endless, inextensible elastomeric belt entrained about each pair of wheel structures;

means for oscillatably mounting said axle on the main frame about an oscillation axis parallel to said longitudinal axis; and

tensioning means for biasingly pulling said axle away from each pair's other wheel structure.

4,681,178

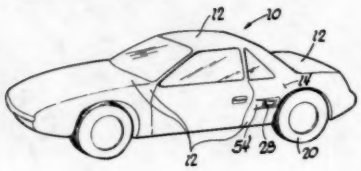
VEHICULAR AIR INTAKE SCOOP

Robert R. Brown, Mt. Clemens, Mich., assignor to Colt Industries Inc, New York, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,831

Int. Cl.[4] B60K *13/02*

U.S. Cl. 180—68.3 **13 Claims**



1. An air scoop for use in combination with a vehicle having vehicular body panel means and an engine with air intake port means formed in said body panel means and communicating with the air induction means of said engine, said air scoop means comprising first and second side wall means upper wall means and rearward end wall means, wherein said first and second side wall means said upper wall means and said rearward end wall means are interconnected, wherein said air scoop means comprises an open forward end and a rearward discharge end, wherein when said air scoop means is operatively secured to said body panel means said first and second side wall means and said rearward end wall means effectively encompass said air intake port means therebetween, said air scoop means further comprising internal passage means for the flow of air from said open forward end to said rearward discharge end, wherein at least a portion of said internal passage means is of a curvilinear configuration as to curvingly direct the flow of air toward said air intake port means, wherein said curvilinear configuration of said internal passage means is defined at least in part by the interior surface of said upper wall means, wherein said interior surface of said upper wall wall means comprises a plurality of adjacently situated arcuate surfaces each for curvingly directing said flow of air toward said air intake port means, wherein said plurality of arcuate surfaces are discrete from each other and are operatively interconnected by integrally formed transitional interior surface portions, and wherein said plurality of arcuate surfaces are staggered with respect to each other as to be progressively further rearwardly of said air scoop means.

4,681,179

COOLING SYSTEM FOR USE IN CAB-OVER TYPE VEHICLES

Yoshimasa Hayashi, Kanakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 29, 1984, Ser. No. 676,426

Claims priority, application Japan, Nov. 30, 1983, 58-226398

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.[4] B60K *11/04*

U.S. Cl. 180—68.4 **13 Claims**

1. In a cab-over type vehicle having:

a roof;

an engine compartment;

an engine disposed in said engine compartment;

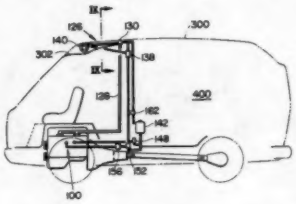
a cooling system for said engine comprising:

a coolant jacket formed about said engine;

a radiator, said radiator being disposed on said roof and communicating with said coolant jacket via a vapor transfer conduit;

a return conduit leading from said radiator to said coolant jacket;

a pump for pumping liquid coolant from said radiator to said coolant jacket via said return conduit;



a liquid coolant reservoir;

a valve interposed between said reservoir and said coolant jacket, said valve controlling fluid communication between said coolant jacket and said reservoir;

a control circuit, said control circuit conditioning said valve in a manner which permits fluid communication between said reservoir and said coolant jacket when said engine is stopped and which selectively cuts off said fluid communication when the engine is running.

4,681,180

POWER TRANSMISSION SYSTEM FOR REAR WHEELS OF A MOTOR VEHICLE

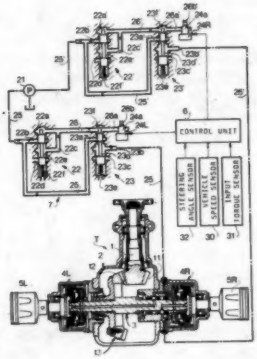
Fusami Oyama, Ohramachi, and Akira Takahashi, Ohta, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,653

Claims priority, application Japan, Oct. 18, 1985, 60-234226

Int. Cl.[4] B60K *17/16*

U.S. Cl. 180—76 **6 Claims**



1. A power transmission system for a motor vehicle comprising:

a rear drive shaft connected to a propeller shaft of the motor vehicle;

final reduction gear means operatively connected to the rear drive shaft;

a pair of oil hydraulic clutches for transmitting output of the final reduction gear to rear wheels of the motor vehicle respectively;

hydraulic circuit means including passage means for applying pressurized oil to said clutches and control valve means for controlling pressure of the oil applied to each of the clutches;

sensing means for sensing driving conditions of the vehicle at cornering and for producing signals representing sensed conditions;

control unit responsive to the signals for operating said control valve means whereby controlling transmitting torque capacity of each clutch at cornering.

4,681,181

ELECTRIC POWER STEERING SYSTEM FOR VEHICLES

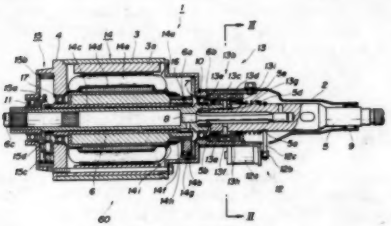
Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1986, Ser. No. 887,304

Claims priority, application Japan, Aug. 6, 1985, 60-173470

Int. Cl.[4] B62D 5/04

U.S. Cl. 180—79.1 **10 Claims**



1. An electric power steering system (60) for vehicles having an electromagnetic servo device (1) including an input shaft (5) operatively connected to a steering wheel, an output shaft (6) operatively connected to a steered wheel, an electric motor (14) for operatively supplying auxiliary torque to said output shaft (6), steering torque detecting means (32) for detecting steering torque (Ts) acting on said input shaft (5), vehicle speed detecting means (50) for detecting the speed (V) of the vehicle, and drive control means (30, 40) which receives an output signal (S_1, S_2) from said steering torque detecting means (32) and an output signal (S_3) from said vehicle speed detecting means (50) and feeds said electric motor (14) with a motor drive signal (Va) in accordance with said output signals (S_1, S_2, S_3), wherein:

said drive control means (30, 40) comprises:

first determining means (109, 110) for determining a component (D(F)) of said motor drive signal (Va) that corresponds to the load due to friction elements of said electromagnetic servo device (1) and a component of said motor drive signal (Va) that corresponds to the load from the road surface side, depending on said output signal (S_1, S_2) from said steering torque detecting means (32);

second determining means (113) for determining a vehicle speed factor (K(V)), depending on said output signal (S_3) from said vehicle speed detecting means (50);

multiplying means (114) for multiplying said road surface side load component (D(L)) by said vehicle speed factor (K(V)) to obtain a corrected road surface side load component (D'(L)); and

adding and outputting means (115, 128, 40) for adding said frictional load component (D(F)) and said corrected road surface side load component (D'(L)) to determine the magnitude of said motor drive signal (Va) and outputting said motor drive signal (Va) to said electric motor (14).

4,681,182

ELECTRIC POWER STEERING APPARATUS

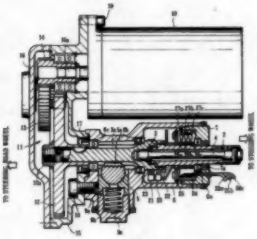
Yoshio Suzuki; Takeshi Ohe, and Ichiro Koike, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,684

Claims priority, application Japan, Apr. 11, 1985, 60-77449; Apr. 19, 1985, 60-82140; Apr. 19, 1985, 60-82141; Apr. 19, 1985, 60-82142

Int. Cl.[4] B62D 5/04

U.S. Cl. 180—79.1 **5 Claims**



1. An electric power steering apparatus comprising:

(a) steering shaft means including a torsion bar to join an input shaft on the side of a steering wheel and an output shaft on the side of a steering road wheel in a manner that they can be rotationally displaced relative to each other,

(b) sensor means of a non-contact type provided in association with said input and output shafts to sense a relative rotational displacement based on a torsion of said torsion bar, and

(c) electic motor means provided around a steeing gear body within which said steering shaft means is disposed, said electic motor means being driven responding to a signal from said non-contact type sensor means to render a steering assistance to an output shafting leading to said steering road wheel, wherein said steering gear body is formed with an annular cavity opened on the side of said input shaft, said cavity extending to the axial end of said output shaft joined through said torsion bar around said input and output shafts, said cavity being adapted to accommodate therewithin said non-contact type sensor means, a printed circuitboard provided around said input shaft close to said non-contact type sensor means and having a circuit for processing a signal from said non-contact type sensor means, a slip ring for taking out an output signal provided in association with said input shaft, a signal take-out unit provided on the side of said steering gear body and having a wiper slidably in contact with said slip ring, and a lead wire outgoing toward the outside penetrating through a cap member closing said cavity within said steering gear body.

4,681,183

ELECTRICALLY OPERATED POWER STEERING DEVICE

Saiichiro Oshita, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,902

Claims priority, application Japan, Oct. 8, 1984, 59-212279

Int. Cl.[4] B62D 5/04

U.S. Cl. 180—79.1 **4 Claims**

1. An electrically operated power steering device for a vehicle having a steering wheel, comprising

a first pinion operatively connected to said steering wheel,

a second pinion,

an electric motor operatively connected to said second pinion,

a rack shaft engaging with said first and second pinions, the rack shaft being moved by rotation of the steering wheel

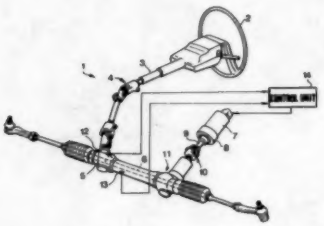
and the electric motor and operatively connected to wheels of the vehicle so as to steer the vehicle wheels,

torsional torque sensor means adjacent the first pinion for measuring torsional torque thereof,

steering angle sensor adjacent the rack shaft for measuring angular displacement of the vehicle wheels, and

means for controlling the electric motor in dependency on said torsional torque and on said angular displacement, and wherein

said means for controlling comprises



an assistance torque designator providing an assistance signal in dependency on the torsional torque,

a restoring torque designator providing a restoration signal in dependency on said angular displacement,

means for adding said signals together, and

means for driving the electric motor by discrimination of the sign of the sum of said signals and by duty ratio control dependent on the absolute value of the sum of said signals under feedback control.

4,681,184

HYDRAULIC REACTION FORCE APPARATUS FOR POWER STEERING SYSTEM

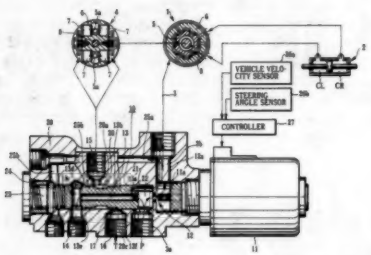
Yoshio Suzuki; Hirotetu Sonoda, and Hideo Yabe, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,031

Claims priority, application Japan, Dec. 27, 1984, 59-274006

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—141 **5 Claims**



1. A hydraulic reaction force apparatus for a power steering system of a vehicle, comprising:

a pump;

a power cylinder for supplying an auxiliary steering force to a steering wheel;

a control valve for switching a hydraulic path from said pump to said power cylinder in accordance with a steering direction of said steering wheel;

a solenoid driven in response to a variable current, said current corresponding to operation conditions of the vehicle;

a first variable orifice arranged between said pump and said control valve, said first variable orifice having a first opening, said first opening being controlled by said solenoid in accordance with said operation conditions of said vehicle;

a hydraulic reaction force chamber, said hydraulic reaction force chamber being disposed between an input member rotated by said steering wheel and an output member interlocked with the wheels of the vehicle, said reaction force chamber supplying, as a reaction force, a pressure corresponding to a hydraulic pressure applied to said power cylinder thereby restricting rotation of said input member; and

a spool valve disposed between said pump and said hydraulic reaction force chamber, said spool valve having a spool, said spool being moveable in accordance with a pressure difference between upstream and downstream pressures of said first variable orifice, said spool valve also having a supply port coupled to said pump, a reaction port coupled to said hydraulic reaction force chamber, a tank port coupled to a tank and a second variable orifice controlled by said spool, said second variable orifice having a second opening which is adapted to be changed as said spool moves in accordance with said pressure difference, thereby connecting said reaction port to said supply port and said tank port and controlling a magnitude of said hydraulic reaction force.

4,681,185

APPARATUS FOR THE AUTOMATIC ENGAGEMENT AND DISENGAGEMENT OF DRIVE ELEMENTS OF A MOTOR VEHICLE

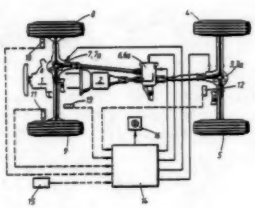
Rudolf Hoernig, Esslingen-St., Bernhard; Peter Herges, Stuttgart; Bernd Knoff, Esslingen; Karl-Heinz Richter, Kernen; Karl-Heinz Buechle, Sachsenheim, and Henning Wallentowitz, Aichwald, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 11, 1986, Ser. No. 828,275

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505455

Int. Cl.[4] B60K *23/08*

U.S. Cl. 180—247 **32 Claims**



1. Apparatus for the automatic engagement and disengagement of drive components of a motor vehicle with a drive axle, particularly the drive means of at least one additional axle, and the locks for auxiliary gear and differential gear, comprising:

sensory means for sensing the rotary speeds of the wheels of said motor vehicle and the steering angle of said vehicle;

control means for receiving at least one input from said sensory means, deriving at least one signal from said at least one input, comparing said at least one signal with at least one reference value stored in said control means, and for controlling the selection of a plurality of switching stages during operation of said vehicle in response to said comparison of said signal and said at least one reference value;

said switching stages being various combinations of engagement of said at least one additional axle and said locks for auxiliary gear and differential gear.

4,681,186

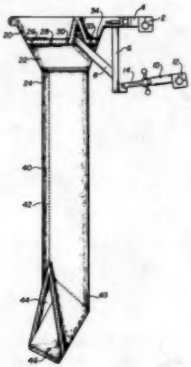
ESCAPE CHUTE

Thomas Leisman, West Linn, Oreg., and Jon Huston, Denver, Colo., assignors to Dynavac, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 660,344, Oct. 12, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,258

Int. Cl.[4] A62B *1/20*

U.S. Cl. 182—47 **18 Claims**



1. An escape device comprising a tubular escape chute having:

an upper end and a lower end,

zipper means extending generally longitudinally along at least a portion of said chute, and

a friction-creating panel which extends over a major portion of the chute's longitudinal length, circumferentially less than the full circumference of the chute, and generally continuously from a portion generally adjacent to said upper end of said tubular escape chute to a portion generally adjacent to said lower end of said tubular escape chute, whereby entry into said chute or egress therefrom may be accomplished intermediate the upper end and lower end, and an individual descending in said chute and contacting said panel will have his or her rate of descent retarded.

4,681,187

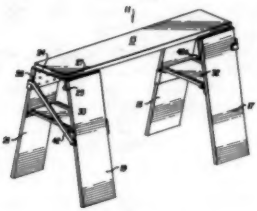
COLLAPSIBLE SAWHORSE

David M. Brown, 178 Chency St., Newport, N.H. 03782

Filed Jul. 8, 1986, Ser. No. 883,405

Int. Cl.[4] B27B *21/00*; F16M *11/00*

U.S. Cl. 182—129 **6 Claims**



1. A collapsible sawhorse comprising

a bench;

two legs depending from said bench on either side thereof;

hinge means for connecting said legs to said bench;

an arm pivotally mounted to one of said legs at opposite sides of said bench, said arms having angularly extending fingers at their terminal ends;

female means mounted on the legs opposite said one of said legs for mating with said fingers when said sawhorse is in an upright position;

a tool shelf extending below said bench; and

hinge means securing said tool shelf between said legs;

whereby said fingers may be removed from said female means and pivoted, permitting said legs to hinge relative to said bench so that said legs, said arms and said bench can be collapsed to a position substantially adjacent to each other.

4,681,188

INTAKE SILENCER

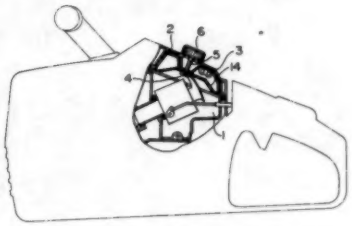
Takanobu Tasaki, Tokyo, and Akira Nagashima, Kawasaki, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed May 28, 1986, Ser. No. 869,455

Claims priority, application Japan, Jun. 5, 1985, 60-83969[U]

Int. Cl.[4] F02M *35/00*

U.S. Cl. 181—229 **3 Claims**



1. An intake silencer comprising a cup-shaped body made of elastic material, siad cup-shaped body covering an air filter element provided at an air inlet of a carburetor chamber of an internal combustion engine, a plurality of intake passages passing through side walls of said body, and means defining a circumferential groove provided along an edge of an opening portion of said body facing said air filter element for receiving an edge of said air filter element.

4,681,189

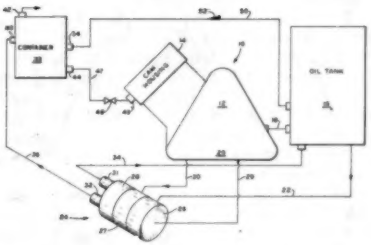
DRY SUMP LUBRICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Steven Kristloff, 4790 W. 16th St., Indianapolis, Ind. 46224

Filed Dec. 4, 1985, Ser. No. 804,673

Int. Cl.[4] F01M *11/08*

U.S. Cl. 184—6.13 **12 Claims**



1. A method for lubricating an internal combustion engine having a crankcase including an oil sump, an oil tank in fluid flow communication with said crankcase, a container, and a one way valve, the method comprising:

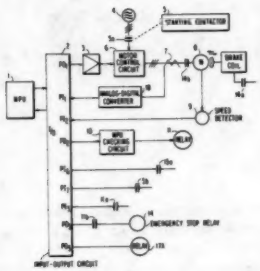
equalizing the pressure between the engine and the sump pumping oil from said crankcase sump;
separating entrained air from said pumped oil;
conducting said oil, from which air has been separated, to said oil tank;
conducting said separated air to said container and separating entrained oil particles from said separated air;
venting said container to the atmosphere; and
preventing pressure buildup in said oil tank and engine by providing a one way valve for relieving pressure in said engine and oil tank.

4,681,190

APPARATUS FOR CONTROLLING AN ELEVATOR

Ishii Toshiaki, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,636
Claims priority, application Japan, Jan. 14, 1985, 60-4226
Int. Cl.[4] G05B *15/00*
U.S. Cl. 187—101 **11 Claims**



1. An elevator control system having a control circuit means for receiving input signals indicative of malfunctions within the elevator control system and for issuing a control signal to cause an elevator to travel in response to a command signal when no malfunctions exist, and comprising:

starting switch means operable to energize said control circuit means;

checking circuit means, responsive to each operation of said starting switch means, for automatically detecting whether the energized control circuit means is operating in a normal or abnormal mode and for generating a first signal indicative of the abnormal mode;

emergency stop means, responsive to said first signal, for preventing travel of the elevator; and

monitoring circuit means, also responsive to the operation of said starting switch means, for automatically detecting whether said checking circuit means is operating in a normal or abnormal mode and for preventing the issuance of said control signal and travel of said elevator if an abnormal mode of said checking circuit means is detected;

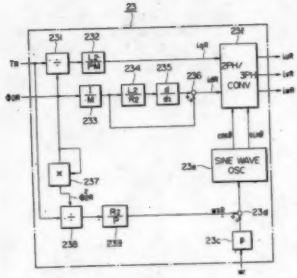
said control circuit means, after energization thereof by the operation of said starting switch means, automatically applying to said checking circuit means an artificial signal indicative of an abnormal mode of said control circuit, and said monitoring circuit means detecting a normal mode of said checking circuit means if said checking circuit means detects an abnormal mode of said control circuit means within a predetermined time after the application of said artificial signal.

4,681,191

SPEED CONTROL APPARATUS FOR ELEVATOR

Hiroyuki Ikejima, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 13, 1985, Ser. No. 733,472
Claims priority, application Japan, May 17, 1984, 59-99495
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—119 **9 Claims**



1. In a drive system for an elevator cage wherein D.C. is inverted into A.C. of variable voltage and variable frequency by a current control-type inverter including an induction motor for driving the cage having field windings supplied with VVVF A.C. primary currents producing a field of intensity determined by the primary currents, a speed control apparatus for said induction motor comprising:

converter means for determining primary current commands on the basis of a torque component current command derived from a torque command and a field component current command derived from a magnetic flux command,

circuit means for deriving primary currents supplied to the induction motor based on the primary current commands, and

means for generating an intensified field component current command before a time of start of movement of the cage and a reduced field component current command after the time of start of movement of the cage, and for supplying the intensified and reduced field component current commands to said converter means to produce an intensified field of the induction motor before the time of start of movement of the cage and a reduced field of the induction motor after the time of start of movement of the cage so as to reduce starting shocks due to an unbalanced load in the cage.

4,681,192

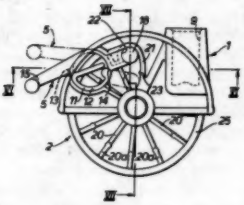
DUAL-WHEEL CASTERS WITH POSITIVE LOCK MECHANISM

Michael J. James, Charlton Kings, England, assignor to Global Castors Limited, Cheltenham, England

Filed Oct. 18, 1984, Ser. No. 662,063
Claims priority, application United Kingdom, Oct. 27, 1983, 8328767
Int. Cl.[4] B60B *33/00*
U.S. Cl. 188—1.12 **6 Claims**

1. A twin-wheel caster comprising a body having a bearing recess molded therein, two wheels rotatably mounted on opposite sides of said body for rotation about a common axis, and a locking lever mounted in said bearing recess for rocking movement about an axis disposed parallel to said wheel rotation axis, said recess being open at outer and inner side apertures which are opposed laterally of said rocking movement axis and through which opposite inner and outer ends of said lever respectively project, said outer end of the lever projecting as

an operating member for external operation of the lever and said inner end of the lever projecting for engagement as a locking member with said wheels of the caster, said lever having an intermediate mounting portion which takes a pivotal bearing in said bearing recess and which is resiliently compressible to a size such that it can be fitted into said recess



through said outer side aperture by lengthwise insertion of said lever into said body laterally of said rocking movement axis and through said apertures, and said intermediate portion of the lever when uncompressed being larger laterally of said rocking movement axis than the corresponding dimension of either one of said apertures so that said intermediate portion is retained captive within the bearing recess.

4,681,193

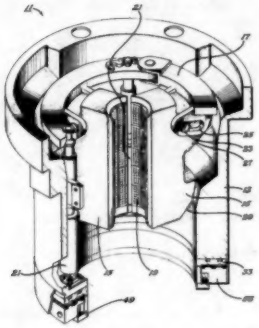
ROTARY POWER SLIPS

William E. Crowe, Round Rock, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 578,907, Feb. 10, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 830,895

Int. Cl.[4] B65H *59/10*

U.S. Cl. 188—67 **7 Claims**



1. Rotary power slips, for use in the rotary table of an earth drilling rig, comprising:

a body;

slip means carried on the body for gripping and releasing pipe in a pipe opening in a rotary table;

a stationary air transfer ring supported by the body, and having a primary fluid conduit for connection to a stationary fluid source on the drilling rig, and having a transverse upper surface with at least two concentric grooves;

an annular seal ring secured to the body and having a transverse lower surface and an air passageway;

expansive means including an expansive ring having inner and outer edges mounted in the grooves on the upper surface of the air transfer ring and cooperative with the lower surface of the seal ring for forming an annular expansive fluid duct to conduct fluid between the primary fluid conduit and the air passageway;

a fluid cylinder mounted on the body and fluidly connected to a secondary fluid conduit through the body to the air passageway for raising and lowering the slip means in response to fluid flow through the primary fluid conduit, the air passageway, and the secondary fluid conduit; and

a retainer ring in each of the grooves on the upper surface of the air transfer ring, compressed against one of the edges of the expansive ring for locking the expansive ring in place.

4,681,194

DISC BRAKE ASSEMBLY WITH PARKING BRAKE MECHANISM

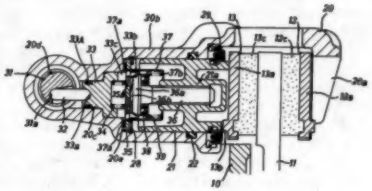
Matsuhisa Tsuruta, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 28, 1986, Ser. No. 845,469

Claims priority, application Japan, Mar. 28, 1985, 60-045539[U]

Int. Cl.[4] F16D *55/16, 65/56*

U.S. Cl. 188—71.9 **9 Claims**



1. A disc brake assembly equipped with a parking brake mechanism, said disc brake assembly including a caliper member having a cylinder body and a reaction portion straddling a portion of a rotary brake disc, and a piston axially slidably disposed in a fluid-tight manner within a cylindrical bore of said cylinder body to be actuated by hydraulic fluid under pressure supplied into said cylinder body, said parking brake mechanism comprising:

a cam shaft rotatably mounted within a lateral bore formed in a bottom wall of said cylinder body and being formed with a cam groove;

a plunger axially slidably disposed in a fluid-tight manner within an axial bore formed in the bottom wall of said cylinder body coaxially with said cylindrical bore and having an outer end opposed to said cam groove and a cylindrical inner end portion formed with an annular tapered surface and a pair of radial slots;

a toggle having one end engaged with said cam groove and another end engaged with the outer end of said plunger;

a support plate fixed in place within said cylindrical bore and having an intermediate portion axially slidably engaged with the radial slots of said plunger to restrict rotation of said plunger;

a spring interposed between said plunger and said support plate to bias said plunger toward said cam shaft;

an adjusting bolt threaded into a nut portion integral with said piston and having a head portion engageable at its center with said support plate and at its outer periphery with the annular tapered surface of said plunger for frictional engagement therewith;

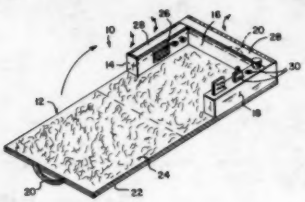
a retainer member arranged in surrounding relationship with the head portion of said adjusting bolt and fixed to said support plate; and

a thrust bearing coupled with the head portion of said adjusting bolt and resiliently retained by a support portion of said retainer member to permit rotation of said adjusting bolt.

4,681,195
CARRY BAG CONVERTIBLE TO A MAT

Curtis J. Trahan; Mary C. Trahan, both of 1309 Droddy Dr., Port Neches, Tex. 77651, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,628
Int. Cl.[4] A45C 9/00, 15/00; A47C 9/10, 17/82
U.S. Cl. 190—2 **3 Claims**

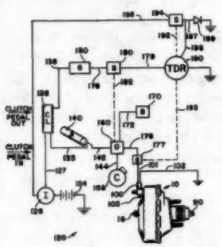


1. A combination carry bag and mat comprising:
(a) a rectangular foldable panel having a water proof bottom sheet and a water absorbent top sheet of a predetermined length and width;
(b) three relatively rigid built-in compartments formed in a C-shaped configuration around edges of said panel at front end thereof, said compartments hold various items including a radio so that when said panel is in an unfolded flat position a person can lie upon said panel to utilize it as said mat for access to said compartments; and
(c) a pair of handles, each of said handles affixed to a short edge of said panel so that when said panel is in a folded position a person can grip said handles to utilize it as said carry bag, wherein said bottom sheet is fabricated out of plastic material and said top sheet is fabricated out of towel-like material, wherein two of said compartments at side and front of said panel include hinged lids in which said radio is built into said side hinged lid compartment.

4,681,196
CONTROL CIRCUIT FOR BRAKE BOOSTER VEHICULAR HILL HOLDER SYSTEM

Keith H. Fulmer, Mishawaka, Ind.; Arthur K. Peebles, Niles, Mich., and Hugh D. Steininger, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 20, 1984, Ser. No. 642,619
Int. Cl.[4] B60K 41/24, 5/00; F15B 7/00; B60T 8/58
U.S. Cl. 192—3 H **31 Claims**

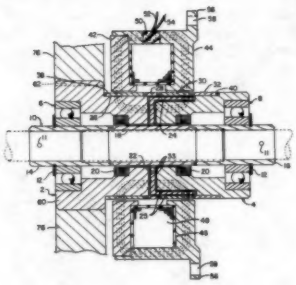


1. A braking assistance servo motor system operable to maintain the braking of a vehicle when the brake pedal is released toward an inactive braking position, comprising a brake booster having a first chamber, a working chamber, first valve means responsive to the brake pedal, output means for operatively actuating brakes of the vehicle, and second valve means operatively connected with the booster, and control circuit means for sensing vehicular parameters and operatively connected to said second valve means, said brake booster operating responsively to said brake pedal by utilizing a pressure differential between the chambers to displace the output means and actuate the brakes, the control circuit means sensing the parameters of vehicular attitude, clutch position, and vehicular speed to actuate responsively thereto the second valve means and provide fluid pressure to said brake booster and maintain the displacement of the output means and actuation of the brakes after the brake pedal has been released, said control circuit means including a clutch pedal position mechanism, transmission gear switch, a second switch responsive to vehicle speed sensor means, a time-delay relay, third and fourth switches responsive to the time-delay relay, and a connection between the fourth switch and time-delay relay, the control circuit means rendering inoperative the second valve means when the vehicle speed sensor means is inoperative by effecting a signal through the clutch pedal position mechanism, transmission gear switch, second switch which is actuated by a lack of signaling from the speed sensor means, and time-delay relay which is actuated by the signal and operates the third switch to prevent actuation of the second valve means and fourth switch to permit continued energization of said time-delay relay through the connection.

4,681,197
ELECTROMAGNETIC CLUTCHES AND BRAKES

Jeffrey C. Pedu, Lake Placid, N.Y., assignor to Placid Industries, Inc., Lake Placid, N.Y.

Filed Sep. 19, 1984, Ser. No. 652,345
Int. Cl.[4] F16D 37/02
U.S. Cl. 192—21.5 **19 Claims**



1. A magnetic particle device comprising:
first and second magnetic pole members;
a shaft;
means rotatably mounting said first and second pole members to said shaft;
a disk connected to said shaft and extending into a first gap formed between confronting faces of said first and second pole members, said first and second faces being close to but space from said disk;
at least one annular flange attached to said disk, said flange extending parallel to the axis of said shaft;
a coupling assembly connecting said first and second pole members so that said first and second pole members and said coupling assembly form a unitary structure, and said coupling assembly comprising at least first and second non-magnetic sleeve members and a magnetic sleeve member connected to and extending between said first and second non-magnetic sleeve members;
a groove in at least one of said pole members for accomodating said at least one annular flange, said at least one annular flange extending into said groove in radial spaced relation with said one pole member and said coupling assembly;
particles of a magnetic material disposed in said first gap and said groove on both sides of said disk and said flange;
means for establishing a magnetic field whose magnetic flux

passes serially through said first pole member, said disk, said second pole member, and said at least one flange so as to magnetize said magnetic particles and transform said magnetic particles into a torque transmitting coupling between said pole members on the one hand and said disk and said flange on the other hand; and

sealing means disposed between said shaft and said pole members for preventing escape of said particles of magnetic material from said first gap between said pole members.

4,681,198

INTEGRAL ACCELERATOR-BRAKE CONTROL FOR MOTORCYCLES

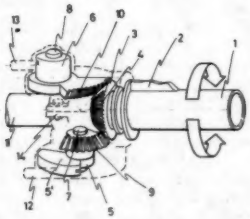
Miguel-Angel Costa Mas, San Joaquín, 19, Jalon (Alicante), Spain

Filed Apr. 18, 1985, Ser. No. 725,018

Claims priority, application Spain, Apr. 23, 1984, 278.973

Int. Cl.[4] B60K *41/20*; G05G *9/02*

U.S. Cl. 192—3 S **2 Claims**



1. Integral accelerator-brake control arrangement for a motorcycle comprising

handle bar support means,

a handle grip rotatable back and forth on the support means about an integrally formed handle axis and having a conical end including a handle grip toothed sector containing teeth along approximately one-third of the perimeter of the conical end, the remainder of said perimeter being substantially smooth, and

two substantially diametrically opposite cylinders located tangentially to the conical end of the handle grip and rotatable back and forth on the support means about corresponding axes of rotation substantially perpendicular to the handle axis, one of the cylinders being an accelerator cable cylinder adapted for mounting connection of an accelerator operating cable thereto and being provided with an accelerator toothed sector, and the other cylinder being a brake cable cylinder adapted for mounting connection of a brake operating cable thereto and being provided with a brake toothed sector,

the accelerator toothed sector and brake toothed sector being arranged in substantially diametrically opposite spaced relation to each other and in tangential relation to the handle grip conical end toothed sector, such that upon rotation of the handle grip in one direction the conical end toothed sector meshes individually only with the accelerator toothed sector for individually controlling accelerating operation, and alternatively upon rotation of the handle grip in an opposite direction the conical end toothed sector meshes individually only with the brake toothed sector for alternatively individually controlling braking operation.

4,681,199

APPARATUS FOR TRANSMITTING TORQUE IN MOTOR VEHICLES

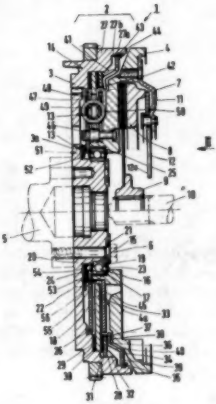
Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Apr. 4, 1986, Ser. No. 848,730

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512372; May 10, 1985, 3516907; Sep. 7, 1985, 3532005

Int. Cl.[4] F16D *13/69, 47/02, 43/14*

U.S. Cl. 192—70.23 **57 Claims**



1. Apparatus for transmitting rotary motion between the output element of the internal combustion engine and the input element of the change-speed transmission in a motor vehicle, comprising a first flywheel connectable to and arranged to receive torque from the output element in the drive direction; a second flywheel rotatable relative to the first flywheel and connectable with the input element to rotate the latter in the drive direction and to be rotated by the input element in the coast direction; at least one slip clutch operating between said flywheels to transmit torque in either of said directions; and means for regulating the magnitude of said torque in at least one of said directions.

4,681,200

FRICTION CLUTCH

Karl Keck, Leutesheim, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 722,194, Apr. 11, 1985, abandoned, which is a continuation of Ser. No. 410,486, Aug. 23, 1982, abandoned. This application Jul. 2, 1986, Ser. No. 881,589

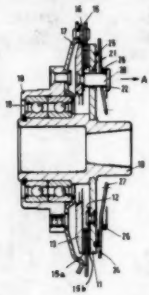
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136711

Int. Cl.[4] F16D *13/44, 25/08*

U.S. Cl. 192—70.27 **22 Claims**

1. A friction clutch for the transmission of driving torque in machines with a pronounced degree of irregularity of torque transmission, particularly a compressor clutch, comprising a first component including an axially fixed first plate having a first side and a second side, a pressure plate located at said first side and movable axially between engaged and disengaged positions, and means for coupling said plates for joint rotation including a first set of axially stressed leaf springs; a second component including an axially movable clutch disc disposed between said plates, a further member and a second set of axially stressed leaf springs for centering and non-rotatably coupling said clutch disc with said further member; means for moving said pressure plate between said positions including at

least one motion transmitting element axially movably extending through said first plate and connected to said pressure plate and means for pulling said motion transmitting element in a direction to move said pressure plate to the engaged position including a prestressed diaphragm spring at the second side of said first plate, said motion transmitting element being rigid



with said pressure plate and having an end portion remote from said pressure plate and outwardly adjacent to the second side of said first plate; retaining means provided in the region of said end portion of said motion transmitting element, said diaphragm spring being tiltable relative to said retaining means; and a seat for said diaphragm spring.

4,681,201

CLUTCH DISC

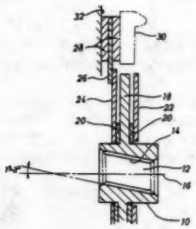
Hiroshi Teramae, Neyagawa, and Yoshinari Yoshimura, Higashi, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Oct. 8, 1985, Ser. No. 785,437

Claims priority, application Japan, Oct. 12, 1984, 59-154794[U]; Oct. 19, 1984, 59-158786[U]

Int. Cl.⁴ F16D *3/14*

U.S. Cl. 192—106.2 **7 Claims**



1. A clutch disc having a flanged hub spline with a spline hole fitted onto a main drive shaft having a center axis, characterized by that the clutch disc is equipped with a forced inclining mechanism for forcedly inclining the axis of the spline of said hub relative to the center axis of the main drive shaft when the facing surface of said clutch disc is pressed against a flywheel, and for the keeping the spline hole of said spline hub parallel to said center axis of said main drive shaft when said facing surface of said clutch disc is out of pressed contact with said flywheel.

4,681,202

APPARATUS FOR THE SAFETY STOPPAGE OF MECHANICALLY MOVED TOOLS, PARTICULARLY AUTOMATIC WELDING GUNS

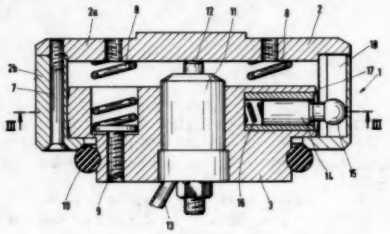
Wilhelm Dinse, Königsreihe 12, D-2000 Hamburg 70, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 869,886

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520562

Int. Cl.⁴ F16D *3/06*

U.S. Cl. 192—129 A **6 Claims**



1. An apparatus for safety stoppage of a mechanically moved tool, comprising:

(a) an assembly casing having longitudinal and transverse axes and inner walls said inner walls including first and second transverse walls and a longitudinal wall therebetween the longitudinal inner wall having a longitudinal slot formed therein;

(b) a swashplate having a first swashplate portion positioned in the longitudinal direction within the inner walls of the assembly casing, the first swashplate portion having spherical side walls facing the longitudinal inner wall of said assembly casing, and a second swashplate portion extending from the first swashplate portion outside the assembly casing and operatively connectable to the mechanically moved tool;

(c) a spring element positioned between said swashplate and first transverse inner wall of said assembly casing for biasing said swashplate and assembly casing apart in the longitudinal direction; with said swashplate and second transverse wall adapted to abut to prevent longitudinal sepatation of said swashplate and assembly casing

(d) a switch operated by relative longitudinal movement between the swashplate and the assembly casing; and

(e) a spring-loaded bolt positioned in a transverse direction in the first swashplate portion and extending from the spherical side wall of said first swashplate portion, said bolt having a head positioned in said longitudinal slot of said assembly casing inner side wall for longitudinal movement therein upon longitudinal movement of said swashplate relative to said assembly casing.

4,681,203

MULTI-TRACK GRAVITY CONVEYOR

Andrew T. Kornylak, Hamilton, Ohio, assignor to Omniquest, Inc., Hamilton, Ohio

Filed Nov. 22, 1985, Ser. No. 800,973

Int. Cl.⁴ B65G *13/00*

U.S. Cl. 193—35 R **60 Claims**

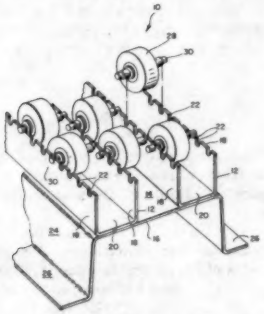
1. An undriven gravity roller conveyor, comprising:

a plurality of rollers mounted on axles, with each of said rollers being mounted on a different one of said axles;

a section providing a base and a plurality of discrete elongate channel members extending from said base in a laterally spaced apart, parallel relation forming a plurality of rows, each of said channel members having integral therewith a plurality of opposite side walls extending along the length of said rows and a connecting side rigidly joining and

maintaining said opposite side walls in a fixed spaced apart relation with the separation between said opposite side walls being equal to the separation between neighboring channel members;

said plurality of opposite side walls in each of said channel members having a plurality of slots formed therein alignable in parallel columns with the corresponding slots in at least the closest of the opposite side walls of a neighboring channel member, said parallel columns being substantially perpendicular to the length of said rows, said slots being open substantially identical and equidistantly spaced on both sides and along an unjoined edge of each of said



opposite side walls in each of said channel members, the spacing between successive slots along said unjoined edge of each side wall being less than the exterior diameter of said rollers within said section; and

said axles being disposable within said slots, both between said plurality of opposite side walls in each of said channel members and between adjacent side walls of neighboring pairs of said channel members with the axles of rollers in any two neighboring rows being disposable in different ones of said columns, whereby the separation between axles of rollers in said any two neighboring rows may be less than one-half of the exterior diameter of said rollers.

4,681,204

DEVICE FOR COUNTING AND SORTING COINS BELONGING TO A SET OF COINS

Gert Zimmermann, Berlin, Fed. Rep. of Germany, assignor to F. Zimmermann & Co., Fed. Rep. of Germany

PCT No. PCT/DE85/00171, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05478, PCT Pub. Date Dec. 5, 1985

PCT Filed May 17, 1985, Ser. No. 836,170

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3419589

Int. Cl.[4] G07D *3/02, 5/10*

U.S. Cl. 194—317 **21 Claims**

1. A device for counting and sorting coins belonging to a set of coins as well as coin-like objects not in the set of coins, comprising:

a horizontal coin plate (3) for receiving coins of the set and coin-like objects not of the set;

a horizontal guideway (8) extending tangentially from said coin plate and having a feed side for admitting coins at said coin plate;

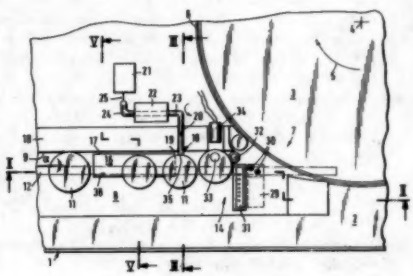
means defining a guiding edge (9) extending along said guide way;

a conveyor belt (12) mounted for movement above said guide way for conveying coins and coin-like objects in a feed direction along a feed path on said guide way from said feed side and for feeding coins and coin-like objects along said guiding rail;

coin identification means (14) disposed adjacent said guide way and near said feed side for identifying coins and coin-like objects on said guide way;

said guide way having a sort-out opening (16*a*) therein downstream of said feed side in said feed direction, said sort-out opening being defined by a guiding ledge (17) extending along said guiding edge (9) with a selected width, and an outer edge (38) extending along said guiding edge, the distance between said guiding edge and said outer edge being smaller than the diameter of a smallest coin in the set of coins;

a diversion element (18) mounted for movement between an inactive position away from said path to an active position



in said path, said diversion element having a front edge (35) which is spaced from said guiding edge (9) by at least said selected width of said guiding ledge (17) in said active position, said diversion element being disposed between said identification means and said sort-out opening in said feed direction, said diversion element being operatively connected to said identification means for movement into its active position when said identification means identifies a coin-like object not in the set for deflecting the coin-like object away from said guiding edge, so that the coin-like object drops into said sort-out opening as the coin-like object is moved along said path by said conveyor belt.

4,681,205

DISPLACEABLE INCLINED HOIST

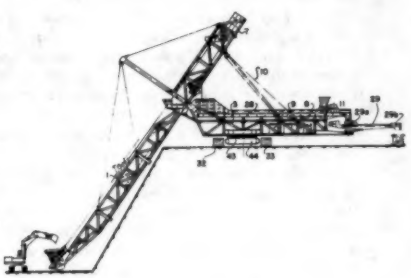
Dieter Hoffmann, Lübeck, and Reinhard Trümper, Ratekau, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel AG, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,134

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430642

Int. Cl.[4] B65G *41/00*; E02F *7/02*; E21C *47/04*

U.S. Cl. 198—307.1 **18 Claims**



1. A displaceable inclined hoist comprising:

a displaceable support;

an inclined support pivotally mounted to said displaceable

support for rotation about a horizontal axis and in a vertical plane;

drive means connected between said displaceable and inclined support for pivoting said inclined support on said displaceable support;

two pairs of tracks connected to said inclined support and extending therealong, said two pairs of tracks having different gauges and each having a middle portion and opposite end portions, said two pairs of tracks lying in a common plane at each of their opposite ends and being disposed one above the other in said middle portions, the upper one of said pair of tracks having a wider gauge than the lower one of said two pairs of tracks;

a conveyor car mounted for riding on each of said two pairs of tracks, said two pairs of tracks being spaced apart in said middle portions thereof by an amount sufficient to permit clearance for one of said conveyor cars riding on a lower one of said two pairs of tracks; and

windlass means connected to said conveyor cars and carried by said inclined support for moving said conveyor cars upwardly and downwardly on said two pairs of tracks respectively.

4,681,206

CURVILINEAR ESCALATOR

Kazuhiko Sugita, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

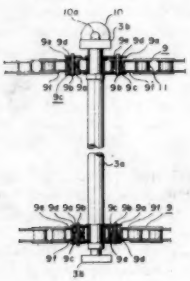
Continuation of Ser. No. 580,957, Feb. 16, 1984, abandoned.

This application Aug. 9, 1985, Ser. No. 763,893

Claims priority, application Japan, Mar. 11, 1983, 58-34941[U]

Int. Cl.[4] B66B *21/06*; B65G *17/42*

U.S. Cl. 198—328 **2 Claims**



1. A curvilinear escalator which comprises:

(a) a main frame having a substantially arcuate shape in the horizontal plane of projection and disposed in an inclined condition, said main frame having a forwarding way formed on the top surface side thereof, a turning section at each distal end part of the main frame in the longitudinal direction thereof, and a return way on the bottom surface side thereof to thereby construct an endless conveying path confined to said arcuate shape;

(b) a plurality of steps continuously disposed in said conveying path and guided therealong, each is said steps being in a sector shape in plan view, each of said steps having a step shaft disposed in the breadthwise direction;

(c) a pair of step chains disposed at both sides of said steps on the edge part in the breadthwise direction thereof and provided along said conveying path and being driven by a sprocket wheel, each step chain being constructed of joint pieces and link member, said joint pieces being engaged with an end part of said step shaft, said link members having one end part connected with one end part of one of said joint pieces, so as to connect said adjacent joint pieces, said link members including rollers;

(d) a spherical joint including a pin, a first bushing having a curved exterior surface and mounted on said pin, a second bushing having an interior surface matching the exterior surface of said first bushing and an exterior cylindrical surface; said cylindrical surface having the same configuration as said rollers and having the same pitch as said rollers so as to be engageable by said sprocket wheel in the same manner as said rollers; whereby said interior surface of said second bushing and said exterior surface of said first bushing form a sliding surface of said joint;

(e) said spherical joint being placed at the connection between said joint piece and said link member so as to allow said link members to be disposed at an angle to said joint members, thus reducing the force exerted on said step chains.

4,681,207

ESCALATOR

Shigeru Goto, Ichinomiya; Masaru Asano, Kohnan; Matsuhiko Ishida, Inazawa, and Shosaku Inoue, Misato, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

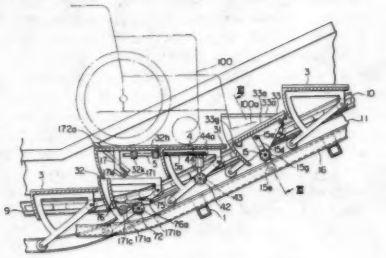
Filed Apr. 18, 1985, Ser. No. 724,662

Claims priority, application Japan, Apr. 19, 1984, 59-78983

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.[4] B65G *9/12*

U.S. Cl. 198—333 **5 Claims**



1. An escalator comprising:

a main frame disposed in a sloped position and defining therein a circulating loop path having a load-bearing run including an upper and lower horizontal portion and an intermediate sloped portion, a return run, an upper turn-around portion, and a lower turn-around portion;

a plurality of first steps having treads and serially disposed along said circulating loop path for circulating movement therealong, said first steps moving horizontally with said treads maintained horizontally when said first steps are in said upper and lower horizontal portions, and said first steps moving upwardly and downwardly along said sloped portion with said treads maintained horizontally when said first steps are in said intermediate sloped portion;

a second step disposed between said first steps for circulating movement together with said first steps and having forks mounted thereon, a forward and backward moving mechanism for said forks, said forks normally being in a retracted position and capable of moving to a projecting position when said mechanism is actuated, said mechanism having an inputting means for moving said forks between the retracted and projecting positions;

a third step disposed between said first and said second steps on the lower side of said second steps for circulating together with said first and second steps and having mounted thereon a vertically movable step which nor-

mally is in a lowered position and said forks are normally in the retracted position;

a first drive mechanism disposed on said main frame at each of the lower and upper horizontal portions of said load-bearing run, said first drive mechanism being normally in a retracted position and, when actuated, engageable with said inputting means when said second step is stopped at either horizontal portion of said load-bearing run for moving said forks into or out of said projecting position;

a second drive mechanism disposed on said main frame at each of the lower and upper horizontal portions of said load-bearing run, said second drive mechanism being normally in a retracted position and being brought into engagement with said inputting means of a movement mechanism of said third step when said third step is stopped at either horizontal portion of said load-bearing run to actuate said movement mechanism to pull out or to insert an engaging rod from or into an engaging hole;

a fourth step disposed between said first and said second steps on the upper side of said second step for circulating movement together with said first and second steps and having mounted thereon and inclinable portion, a movable mechanism for said inclinable portion, said inclinable portion normally being maintained horizontally and being changeable to a sloped position when said movable mechanism is actuated;

said movable mechanism of said fourth step including an inputting member normally maintained in a retracted position and capable of moving into a forward position when actuated;

a forward drive mechanism mounted on said main frame at each of the lower and upper horizontal portions of said load-bearing run, a displacement mechanism for said forward drive mechanism, said forward drive mechanism normally being maintained in a retracted position and, when actuated, engageable with said movable mechanism of said fourth step when said fourth step is stopped at either horizontal portion of said load-bearing run for moving said inputting member of said movable mechanism of said fourth step forward; and

an actuator rail mounted on said main frame along said load-bearing run, said actuator rail being engageable with said inputting member of said movable mechanism of said fourth step when said inputting member is in the forward positon for displacing said inputting member of said movable mechanism of the fourth step in said sloped portion of said load-bearing run to incline the inclinable portion of said fourth step.

4,681,208

METHOD AND APPARATUS FOR PRESENTING AN ARTICLE TO A WORK STATION

Robert V. Harringer, Joliet; Robert O. Rada, Brookfield, and Edward J. Vesely, Woodridge, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 5, 1985, Ser. No. 762,654
Int. Cl.[4] B65G *43/08*
U.S. Cl. 198—341 **9 Claims**

1. A method of moving articles to a work station comprising the steps of:

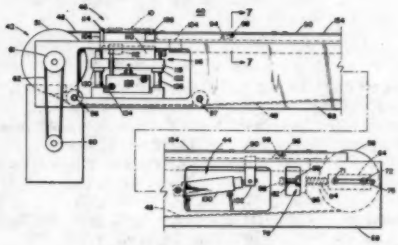
positioning the articles contiguous to each other on a conveyor system in a first plane;

driving the conveyor system so that a first one of the articles is moved past, and detected by, a first and then a second sensor;

generating a first signal in response to the detection of the first article by the second sensor and generating a second signal in response to the detection of a second article, adjacent to said first article, by the first sensor;

raising a pair of rails positioned beneath the second and subsequent articles in response to the first and second signals to raise the second and subsequent articles upward and away from the first article and out of engagement with the conveyor system to a second plane above the first plane of the conveyor system;

elevating the first article in response to the first signal to a work station located above the second plane of the raised second article; and



after the first article is elevated, lowering the pair of rails to lower the second and subsequent articles into engagement with the conveyor system,

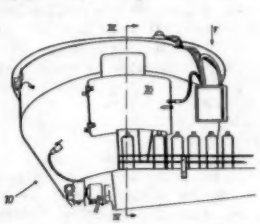
where the pair of rails is raised to separate the second and subsequent articles from the first article before the first article is elevated.

4,681,209

MACHINE FOR POSITIONING CONTAINERS

Jaime S. Marti, Emancipacion #8,10,1A, Barcelona, Spain

Filed Apr. 9, 1984, Ser. No. 598,416
Claims priority, application Spain, Apr. 8, 1983, 52.1347
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—392 **9 Claims**



1. A machine for orienting containers such as plastic bottles, the machine comprising:

a hopper;

a first disc in said hopper;

means to rotatably mount said disc for rotation about an axis inclined to the vertical;

means for feeding containers onto the disc;

a plurality of detachable container holding elements removably mounted at the periphery of the disc and defining peripheral recesses between said elements for receiving individual containers and moving said containers from a low level to a high level upon rotation of the first disc;

a plurality of passageway means extending downwardly below said first disc, each passageway means being aligned below one of said corresponding peripheral recesses and having a configuration to receive and orientate containers falling into said passageway means into an upright position;

means for preventing containers from falling into said passageway means, except at a drop zone at a higher level of the disc for allowing containers to fall into said passageway means at said higher level;

means for receiving the uprightly orientated containers from the lower ends of the passageway means;

means to detachably connect said holding elements to said disc so that said holding elements can be interchanged with other holding elements; and

means for detachably mounting said passageway means around the periphery of said first disc to facilitate interchangeability thereof with other passageway means to enable the machine to handle containers of different shapes and sizes.

4,681,210

APPARATUS FOR FEEDING BARS THROUGH A BENDING OR LIKE PROCESSING STATION

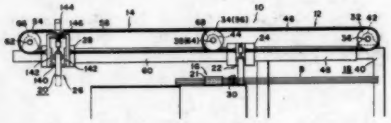
Toshiyuki Miki, Sagamihara; Kunio Tomioka, Kawasaki; Masao Nakajima, Matsuto, and Terushige Sakurai, Komatsu, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho and Aoki Corporation, both of Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,991

Claims priority, application Japan, Aug. 23, 1984, 59-174026; Aug. 23, 1984, 59-126971[U]; Aug. 23, 1984, 59-126973[U]

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—468.2 **7 Claims**



1. Apparatus for feeding a bar or a plurality of bars along a predetermined path extending through a processing station such as a bar bending station, comprising:

(a) a first conveyor extending between a loading end of the predetermined path and the processing station;

(b) a first gripper assembly mounted to the first conveyor thereby to be reciprocably transported between the loading end and the processing station, the first gripper assembly being capable of releasably gripping a bar or a plurality of bars in a vertical pile for transporting same from the loading end to and through the processing station where the bar is processed;

(c) a second conveyor arranged collinearly with the first conveyor and extending between the processing station and an unloading end of the predetermined path;

(d) a carriage mounted to the second conveyor thereby to be reciprocably transported between the processing station and the unloading end;

(e) a second gripper assembly mounted to the carriage on the second conveyor for up and down motion relative to the carriage, the second gripper assembly being also capable of releasably gripping a bar or a plurality of bars in a vertical pile for transporting same through the processing station in coaction with the first gripper assembly and further for transporting the processed bar or bars away from the processing station to the unloading end;

(f) lift means for moving the second gripper assembly up and down on the carriage, the second gripper assembly gripping the processed bar or bars while being lowered and being subsequently raised with the processed bar or bars preparatory to transportation thereof to the unloading end;

wherein each of the first and second gripper assemblies includes,

(a) pair of gripping jaws pivotable relative to each other;

(b) a plurality of interchangeable sets of gripping teeth for gripping bars of different diameters, each set being comprised of at least one pair of gripping teeth to be replaceably mounted one to each gripping jaw in opposed relation to each other for engaging a bar or bars therebetween; and

(c) means for pivoting one of the gripping jaws toward and away from the other for the engagement and disengagement of the bar between and from the opposed gripping teeth; and

wherein the pair of gripping jaws of each gripper assembly have a pair of undercut grooves formed in their opposed faces for slidably engaging a selected set of a pair or pairs of gripping teeth, each pair of gripping teeth partly protruding from the undercut grooves for gripping a bar or bars therebetween, and wherein the apparatus further comprises means for retaining the gripping teeth engaged in the undercut grooves.

4,681,211

TRANSPORT DEVICE FOR PIECE GOODS OR THE LIKE

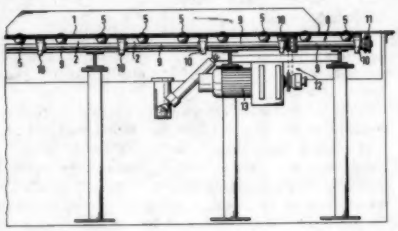
Rudolf Lödige, Paderborn; Bernhard Leonhard, Warburg-Scherfede, and Volker Stille, Baunatal, all of Fed. Rep. of Germany, assignors to Dipl.-Ing. A. Loedige GmbH, Paderborn, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,361

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3439966

Int. Cl.[4] B65G *13/06*

U.S. Cl. 198—789 **1 Claim**



1. A transport device for piece goods or the like, having rolling members (5) for directly supporting the piece goods and arranged partly below a plate member comprising a plate or plate segments (1) which supplement each other in plate-like manner, and rolling drive devices below said rolling members (5) which are guided in holes (3) in the plate or plate segments (1), the rolling members (5) having their top portions protruding above the top side (6) of the plate or plate segments (1) and being arranged in linear rows (7) transverse to the direction of transport, characterized in that said rolling drive devices are cylindrical shafts (8), one of which is mounted centrally below each row (7) of rolling members (5) and parallel thereto and supports the rolling members (5) of the corresponding row (7) in direct rolling frictional engagement therewith, characterized in that the shafts (8) extend over the entire length of the corresponding row (7) of rolling members (5) and the transport device further comprises support elements (10) which multiply support the shafts (8) and which lie one behind the other in axial direction, and further characterized in that the transport device comprises shaft sections (9) lying between the support elements (10) and two rolling members (5) are supported in each case on the shaft sections (9).

4,681,212

ACCUMULATING CONVEYOR

Jack E. Miller, St. Clair Shores, Mich., assignor to Harry Major Machine & Tool Co., Fraser, Mich.

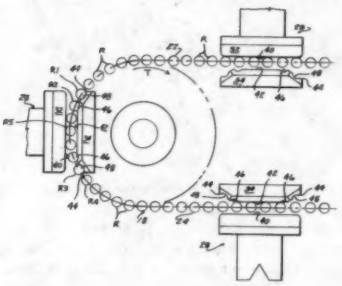
Continuation-in-part of Ser. No. 761,584, Aug. 1, 1985, Pat. No. 4,598,818. This application Apr. 11, 1986, Ser. No. 850,260

Int. Cl.[4] B65G *17/00*

U.S. Cl. 198—803.2 **2 Claims**

1. For use in combination with an accumulating conveyor comprising a pair of like end sprocket means of like radius mounted for rotation about spaced, parallel, horizontal axes, an endless multiple-strand roller chain, at least one strand of said

chain being operatively trained in tension about said end sprocket means, means for supporting and guiding said one strand of said chain along horizontal upper and lower runs extending between said sprocket means, a second strand of said chain being supported by said one strand laterally clear of said sprocket means and said means for supporting and guiding, and drive means for driving said chain in continuous movement along an endless path; an article carrier adapted to be mounted on said second strand of said chain, said carrier including mounting means mounted on the carrier and engaged with said second strand to support the carrier upon said second strand and operable to frictionally couple the carrier to said chain when the carrier is on the upper or lower run of the chain; said carrier including a frame and said mounting means comprising a rigid outer support plate and a rigid inner support plate fixedly mounted on said frame to be respectively located at the outer and inner side of the endless path of movement of said second strand, said support plates having opposed chain engaging edges including opposed straight edge sections extending a fixed, spaced, relationship to each other and spaced from each other by a distance greater than the diameter of the rollers of said chain, the straight edge section of said outer support plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand of



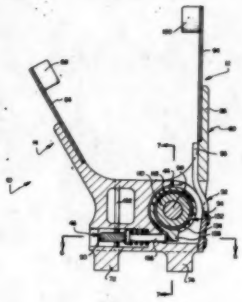
said chain when said carrier is located on said upper run and the straight edge section of said inner plate having a length sufficient to span a plurality of rollers of said chain to stably support said carrier upon said second strand when said carrier is located on said lower run, said chain engaging edge of said inner plate terminating at opposite ends in beveled edge sections inclined from the straight edge section inwardly of said endless path at an obtuse included angle, the straight edge section of said inner plate terminating at each end in means defining a concave curved first recess formed to define a chain roller receiving seat, the length of said straight edge section of said inner plate being related to the radius of said sprocket means and the pitch of said chain such that during transit of said plates around the curved portions of said endless path defined by said end sprocket means two non-adjacent rollers of said second strand are respectively seated in said first recesses and the straight edge section of said outer plate being spaced from the straight edge section of said inner plate by a fixed distance such that during transit of said plate around said curved portions of said endless plate, the straight edge of said outer plate tangentially engages a roller of said second strand intermediate said two rollers to positively retain said two rollers seated within said first recesses to couple said carrier to said claim.

4,681,213

GRIPPER ASSEMBLY

Michael E. Winiasz, Lorain, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 23, 1985, Ser. No. 790,431
Int. Cl.[4] B65G *47/86*
U.S. Cl. 198—803.9 **11 Claims**



1. A gripper assembly for clampingly gripping articles, said gripper assembly comprising a first clamp member, a first surface area connected with said first clamp member, a second clamp member rotatable relative to the first clamp member from a fully open position to any one of a plurality of closed positions to enable articles of different sizes to be gripped between said clamp members, a second surface area connected with said second clamp member, and releasable retainer means operable between an engaged condition preventing rotation of said second clamp member from any one of the plurality of closed positions to the fully open position and a release condition in which said second clamp member is rotatable from any one of the plurality of closed positions to the fully open position, said retainer means including a coil spring having a plurality of turns, said turns of said coil spring including inner side surface means for gripping said first and second surface areas when said retainer means is in the engaged condition to prevent rotation of said second clamp member toward the fully open position, said inner side surface means of said coil spring and one of said surface areas being rotatable relative to each other when said retainer means is in the release condition to enable said second clamp member to rotate toward the fully open position.

4,681,214

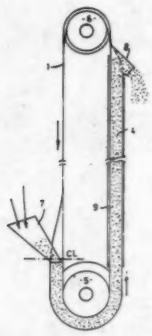
TUBULAR CONVEYOR

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah 2229, New South Wales, Australia

PCT No. PCT/AU85/00071, § 371 Date Dec. 6, 1985, § 102(e) Date Dec. 6, 1985, PCT Pub. No. WO85/04639, PCT Pub. Date Oct. 24, 1985
PCT Filed Apr. 4, 1985, Ser. No. 810,330
Claims priority, application Australia, Apr. 12, 1984, PG4534; Apr. 4, 1985, 40963/85
Int. Cl.[4] B65G *15/08*
U.S. Cl. 198—819 **5 Claims**

1. A conveyor comprising two pulleys spaced apart vertically with an endless belt extending around the pulleys and therebetween to provide a down run of belt and an up run of belt, the belt being made of a resilient material and having a tubular form and longitudinal slit, the peripheral surface of the lower pulley having a laterally extending concave profile with a radius of curvature which is substantially the same as the radius of curvature of the exterior of the belt, the peripheral surface of the upper pulley having a laterally extending convex profile, a feed means to feed material into the down run of belt adjacent the lower pulley and a discharge station to discharge

material from the up run of belt adjacent the upper pulley, the belt being in the tubular form from the feed means around the lower pulley to the discharge station, a retaining means embracing the up run of the belt from adjacent the lower pulley to the discharge station for maintaining the belt closed with the edges of the slit in abutting contact, the belt being opened laterally outward by the convex profile of the upper pulley as the belt leaves the retaining means to allow material to gravitationally discharge from the belt at the discharge station, the belt remaining open around the upper pulley and along the down run of belt to adjacent the feed means where the belt is returned to the tubular form by the convave profile of the lower pulley, the feed means being located at an elevation above the point where a line at the angle of repose of the material to be conveyed is tangent to the inner surface of the belt as is passes onto the lower pulley.



4,681,215

CONVEYOR ROLLER AND BEARING ASSEMBLY WITH EXTERNAL SUPPORT

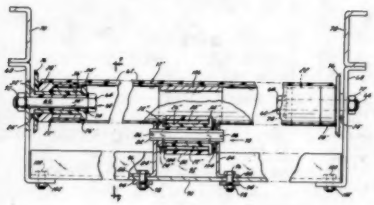
Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Continuation-in-part of Ser. No. 706,698, Feb. 28, 1985, Pat. No. 4,577,747. This application Dec. 20, 1985, Ser. No. 811,612

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] B65G *39/10*

U.S. Cl. 198—843 **9 Claims**



1. A conveyor roller and bearing arrangement adapted for rotary movement between spaced, side support frame members comprising:

a tubular roller having open ends;

a bearing assembly mounted in each end of said roller;

a stub axle at each end of said roller extending through said bearing assembly and said frame member; and

means located between said frame members for supporting said roller externally thereof and including at least one guide roller engageable with the lower portion of said roller, said roller being provided internally with a reinforcing stiffener in the area where said guide roller is engageable with said roller, said bearing assemblies and said stub axles cooperable with said means for supporting said roller to reduce the bending movement of said roller under load.

4,681,216

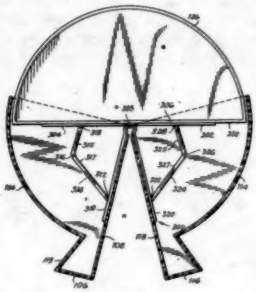
DISPLAY CASE FOR FRAGRANCE BOTTLES, JEWELRY, OR THE LIKE, AND HINGE USED THEREIN

Philip P. Simkins, New York, N.Y., assignor to Steven W. Hewitt, Mt. Kisco, N.Y., a part interest

Filed Jun. 10, 1986, Ser. No. 872,670

Int. Cl.[4] B65D *79/00*

U.S. Cl. 206—45.13 **7 Claims**



1. A container capable of being moved from an open position to a closed position, comprising:

an enclosure member comprising a first section and a second section, the first section and the second section being connected to each other at a common hinge point and being movable with respect to each other from an open position to a closed position and in a closed position defining a first cavity;

a tray member being arranged and constructed so that it is disposed within the first cavity when the first section and the second sections are in their closed position, and the tray member being exposed for access when the first section and the second section are in their open position; and

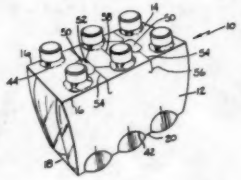
hinge means for connecting and allowing movement among the first section, the second section, and the tray member, the hinge means being arranged and constructed so that the first section and the second section may be pivoted about the common hinge point, whereby the hinge means comprises a first elongated member attached to the tray member, a second elongated member attached to the first section, a third elongated member attached to the second section, with the second and third elongated members being pivotably connected to the first elongated member at substantially the same position along its longitudinal length, first support means connecting a first portion of the first elongated member and the second elongated member, second support means connecting a second portion of the first elongated member and the third elongated member, and when the container is in the open position the first support means and the second support means restrict pivotal movement of the tray member with respect to the first section and the second section.

4,681,217

WRAP-AROUND CARRIER WITH IMPROVED HANDLE

Kenneth J. Hernandez, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Oct. 16, 1986, Ser. No. 919,735
Int. Cl.[4] B65D *5/46*
U.S. Cl. 206—141 **11 Claims**



1. A wrap-around article carrier, comprising:
a top panel;
a bottom panel;
side panels integral with and foldably connected to the top and bottom panels;
the top panel containing two tabs in the central portion thereof, the tabs being connected to the top panel along fold lines extending transversely of the folds connecting the side panels to the top panel;
the tabs being spaced from each other a distance enabling the thumb and finger of a user to push the tabs down, pivoting them out of the plane of the top panel about their fold lines;
the top panel also containing two slits extending across the width of the top panel and terminating in the side panels, the portion of the top panel between the slits comprising the handle portion of the carrier;
the central portion of each slit including the outer boundaries of one of the tabs; and
the handle portion containing a score line intermediate the slits and extending transversely of the folds connecting the side panels to the top panel, the portions of the handle between the slits and the score line folding upwardly about the score line when the carrier is lifted by the handle portion.

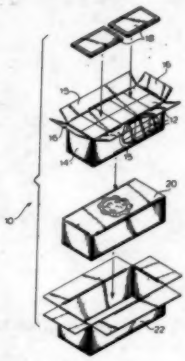
4,681,218

MOISTURE-CONTROLLED GLASS MICROSCOPE SLIDE PACKAGE

Edward L. Williams, Oxnard, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 15, 1982, Ser. No. 358,147
Int. Cl.[4] B65D *81/26*
U.S. Cl. 206—204 **12 Claims**

1. A package of moisture-controlled glass microscope slides comprising:
a container; a plurality of flat, thin glass microscope slides inside said container stacked in face-to-face arrangement; a moisture barrier sealed around said container; and a desiccant inside the space sealed by said moisture barrier for removing substantially all the moisture from the slides over a prolonged period of time at a rate which permits moisture on the surfaces of said slides to react with the glass in a chemical reaction which increases the surface



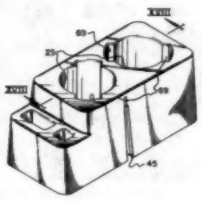
lubricity of said slides without causing visual deterioration of said slides.

4,681,219

ACCESSORY FOR BASS FISHING BOAT

Doyle Kitchens, 120 Meandering Way, Del Rio, Tex. 78840

Continuation-in-part of Ser. No. 691,381, Jan. 14, 1985. This application Nov. 1, 1985, Ser. No. 794,146
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—315.11 **20 Claims**



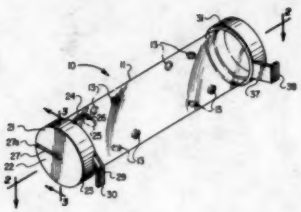
1. An accessory for holding containers and hand tools on a boat used for recreational purposes, comprising:
a. a main body having a top wall and a plurality of side walls coupled to said top wall, said main body further comprising:
i. at least one cylindrical cavity disposed within said top wall, said cylindrical cavity having a side wall and a bottom wall, said cylindrical cavity being of sufficient diameter and depth to contain a cylindrical container such as might be utilized on said boat;
ii. at least one cavity disposed within said top wall, said cavity having side walls and a bottom wall, said cavity being of sufficient size and shape to contain hand tools such as might be utilized on said boat for fishing purposes;
iii. a narrow wedge-shaped slot in one of said main body side walls, said slot beginning at the bottom edge of said main body side wall and traversing upward toward said top wall in a tapered manner;
b. a mounting bracket further comprising:
i. a mounting plate with apertures suitable for receiving fasteners to affix said mounting bracket to the interior of said boat;
ii. a mounting web coupled to said mounting plate, wherein said web is shaped and sized to matingly engage with said slot;
iii. means for retaining said web within said slot.

4,681,220

CONTAINER FOR AN OFFSHORE FISHING LURE

Robert G. Beneke, 11620 Wander La., Dallas, Tex. 75230

Filed Jan. 31, 1986, Ser. No. 824,379
Int. Cl.[4] A01K *93/00*
U.S. Cl. 206—315.11 **7 Claims**



1. A container for an offshore fishing lure and leader secured thereto, said container comprising:

an elongated cylinder sized and proportioned to contain said lure there within and said leader outside thereof in securement thereto;

first and second end pieces fitted on the ends of said cylinder;

said first end piece being sized and proportioned to frictionally and removably fit on one end of said cylinder to selectively substantially close said end and contain said lure within said cylinder;

said first end piece having a face and a generally depending cylindrical skirt sized to engage said cylinder in frictional securement thereto;

said first end piece having a slot through said face and said skirt thereof for admitting passage of said leader on said offshore fishing lure;

means for securing said leader to said container with said lure container therein;

said leader securing means comprising a first half-cleat projecting from said first end piece at a side thereof, and a second, oppositely disposed half-cleat projecting from said second end piece at a side thereof, each said half-cleat including a horn and said horns of said oppositely disposed half-cleats extending axially outwardly from said cylinder in opposite directions when said first end piece is fitted on said cylinder; and means for maintaining said oppositely disposed half-cleats in substantially arcuate alignment with each other when said first end piece is substantially closing said one end of said cylinder for facilitating alignment and wrapped securement of said leader around said half-cleats.

4,681,221

HOLDER FOR PLASTIC LEADED CHIP CARRIER

John J. Chickanosky, Grand Isle; Jack W. Courtney, Underhill, both of Vt., and Robert H. Murphy, Merrimac, N.H., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1986, Ser. No. 925,353
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 **8 Claims**

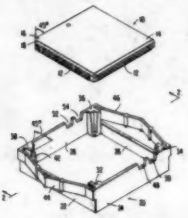
1. A single-piece substantially rectangular molded plastic holder for a substantially rectangular integrated circuit module having external leads extending along the bottom of the module, said holder comprising:

four vertical side walls forming a substantially rectangular, vertically-extending cavity for receiving a module inserted in the cavity from the top of the holder, said four side walls forming four corresponding internal corners of said holder;

and inwardly extending supporting means, in each of said corners, for supporting a corresponding one of the four corners of an inserted module so that the bottom surface of the module is above the bottom edges of said side walls and so that the leads are accessible through the bottom of the holder; and

flexible, snap-acting bistable retaining arm means for clamping a module in said holder;

each of said retaining arm means being formed integrally with said holder and having opposite arm ends fixed at opposite points along a line parallel to a respective one of a first pair of opposing side walls;



said retaining arm means having an outwardly-extending first stable position in which the cavity is open for the insertion or removal of a module, and an inwardly-extending second stable position in which the cavity is closed;

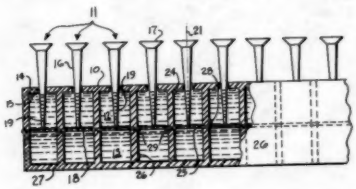
the vertical height of an operative portion of the module-receiving cavity being defined by the vertical distance between said supporting means and lower edges of said retaining arm means.

4,681,222

ORIENTED ARRAY OF SELF-LOCKING FASTENERS

Raymond L. Longhenry, HCR 55700 Saber St., Homer, Ak. 99603

Filed Dec. 24, 1985, Ser. No. 813,263
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—347 **1 Claim**



1. An assembly of self-locking fasteners comprising:

(a) a semi-rigid holding panel having upper and lower flat surfaces,

(b) a multitude of elongated fasteners, each having a shaft portion terminating in head and bottom extremities, said fasteners being removably held by said panel in a manner such that the long axis of each fastener is perpendicular to the panel and the head extremity is above said upper flat surface, said fasteners being uniformly spaced apart in an array having straight lines, and

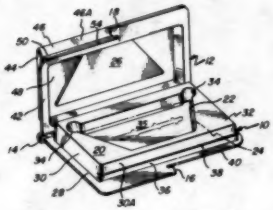
(c) at least one air-impermeable compartment associated with each fastener below said lower flat surface and containing a liquid bonding agent having a viscosity within the range of about 4 poises and 80 poises, measured at 25 degrees C., and capable of curing to solid form, the shaft portion of said fastener being immersed in said bonding agent.

4,681,223

KNIFE BLADE PACKAGE AND CONTAINER THEREFOR

C. Kenard Roberts, Clinton, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Feb. 4, 1986, Ser. No. 825,905
Int. Cl.[4] A45C 11/26
U.S. Cl. 206—354 7 Claims



1. A self-hinging one-piece container integrally formed from synthetic plastic material for knife blades and the like and comprising:

(a) a base element having a peripheral flange and a pedestal portion including a peripheral wall extending upwardly from said flange and spaced inwardly from its side margins, a support wall extending transversely across the upper end of said peripheral wall and an article-receiving recess in said support wall spaced inwardly from the peripheral wall and extending over the greater portion of the area thereof, said recess being defined by a base wall extending substantially in the plane of said flange and a sidewall extending between said base wall and the peripheral portion of said support wall lying in the plane of the upper end of said peripheral wall, said recess being configured and dimensioned to seat snugly a multiplicity of knife blades or the like; (b) a cover element including a peripheral flange overlying said peripheral flange of said base element and a pedestal portion overlying said pedestal portion of said base element, said cover element pedestal portion including a peripheral wall extending upwardly from said flange and inwardly from its margins along the outer surface of said peripheral wall of said base element, a top wall extending transversely of the upper end of said peripheral wall of said cover element and overlying said support wall of said base element, and a depending boss spaced inwardly from the peripheral margins of said top wall and extending below the plane of said support wall and into said recess to retain the knife blades and the like stored within the confines of said recess;

(c) a hinge element extending between adjacent margins of said flanges of said base and cover elements to provide a self-hinging connection therebetween; and

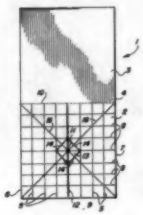
(d) releasable engagement means on said cover and base elements, said container being of elongated, generally rectangular configuration with said hinge element extending along the margins of said flanges along one of the elongated sides, said releasable engagement means being disposed along the flange on the other elongated side, said releasable engagement means including resiliently deflectable overlying finger portions on said flanges deflectable to engage the finger portion of said cover element below said finger portions of said base element.

4,681,224

FLORIST'S IMPLEMENT

Ludwig C. Niemann, 1543-D Coleman Rd., Knoxville, Tenn. 37909, assignor to Gerald R. McCully, Tucson, Ariz. and Ludwig C. Niemann, Knoxville, Tenn.

Filed Dec. 4, 1986, Ser. No. 938,158
Int. Cl.[4] B65D 85/50
U.S. Cl. 206—423 7 Claims



1. An implement for temporarily stabilizing a container comprising:

(A) first and second square sheets;

1. each said square sheet having upper and lower faces;
2. each said square sheet having first, second, third and fourth equal length edges;
   a. all said edges of said first and second sheets being the same length;
   b. said first and third edges of each said shet being parallel to one another;
   c. said second and fourth edges of each said sheet being parallel to one another;
   d. adjacent edges of each said sheet joining at right angles;

(B) means hingedly connecting said fourth edge of said first sheet with one edge of said second sheet such that said second sheet may be folded beneath said first sheet to bring said lower face of said second sheet into juxtaposition with said lower face of said first sheet;

(C) a grid of scores in said upper face of said first sheet, said grid of scores comprising:

1. a first series of a predetermined odd number of equally spaced scores arranged parallel to said first and third edges of said first sheet, the center one of said first series of scores passing through the center of said upper face of said first sheet, said center one of said first series of scores being a heavy score;
2. a second series of said predetermined odd number of equally spaced scores arranged parallel to said second and fourth edges of said first sheet, the center one of said second series of scores passing through the center of said upper face of said first sheet;

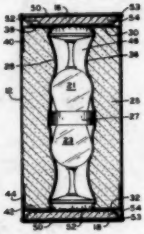
such that said upper face of said first sheet is divided by said first and second series of scores into an array of square areas, a central group of four of which square areas have respective corners meeting at the center of said upper face of said first sheet; and

(D) first, second, third and fourth heavy scores in said upper face of said first sheet, said heavy scores extending, respectively, across diagonal dimensions of said central group of four square areas to define a diamond shaped area having its center at the center of said upper face of said first sheet.

4,681,225
GLASS AND BOTTLE TOTE

Lorenz M. Schuster, 2163 Iglehart Ave., St. Paul, Minn. 55104

Filed Jun. 16, 1986, Ser. No. 874,515
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—426 7 Claims



1. A carrying case for delicate articles such as glasses or bottles comprising,

an elongated container body having a first end and a second end,

said container body being formed from a self-supporting body of foam rubber which itself serves as a supporting structure for the case having an elongated tubular opening extending from said first end to said second end and communicating with each end through an opening therein,

said tubular opening being somewhat smaller in diameter than the size of a typical article to be contained therein whereby each segment along a longitudinal axis of the foam rubber body will be forced in sequence to stretch outwardly over the article as the article is introduced through one of said openings and portions of the foam rubber body thereby extending centrally into depressions, if any, in the delicate articles thereby at least in part conforming to the surface contours thereof,

a slippery liner contained within a logitudinally extending opening,

said liner being capable of extending outwardly as the article is inserted and being slippery enough to allow the article to slide through the enclosing foam rubber body as segments thereof sequentially expand and contract thus conforming to its surface as the article is inserted, and

a compressible and collapsible cover at each end of the carrying case extending across the opening at each end thereof and each cover including a releasable closure means for opening the cover to facilitate insertion and removal of articles into the elongated passage.

4,681,226
RECORDING BOX

Roger Pretre, 22, Rue de Sevres, Boulogne 92100, France

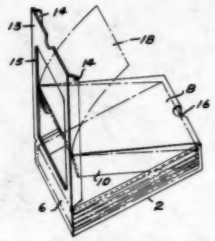
Filed Jan. 17, 1986, Ser. No. 819,593
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—449 5 Claims

1. A recording box fabricated from a folded unitary blank for containing and dispensing fanfolded sheets, comprising:

a box having a bottom panel, first and second upstanding, lengthwise extending side panels connected to said bottom panel at respective first lengthwise fold lines, and first and second upstanding end panels connected to said bottom panel at respective first widthwise fold lines, said first and second end panels spaced a selected lengthwise dimension from one another;

an intermediate partition connected to one of said end panels along a second widthwise fold line and having means for positionally maintaining said intermediate partition superposed above and substantially parallel to said bottom panel, said intermediate partition having a length less than the lengthwise spacing dimension between said first and second end panels to define a slot between the other of said end panels and the remote end of said intermediate partition; and

a top panel connected to the other of said end panels along a respective fold line and having means for positionally maintaining said top panel superposed above and substantially parallel to said intermediate partition to define a sheet passage therebetween, said top panel having a cut-out formed therein;

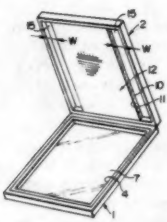


wherein a supply of edge-to-edge connected sheets is contained within the box between said bottom panel and the intermediate partition with the sheets passed through the slot and the sheet passage to provide access to a sheet through the cut-out, the intermediate partition functioning as a sheet support surface.

4,681,227
CASSETTE FOR STIMULABLE PHOSPHOR SHEET

Kaoru Tamura, and Shumpeita Torii, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1985, Ser. No. 719,847
Claims priority, application Japan, Apr. 4, 1984, 59-67290; Apr. 4, 1984, 59-67291
Int. Cl.[4] B65D *81/30*
U.S. Cl. 206—455 6 Claims



1. A cassette for removably housing a stimulable phosphor sheet for storing a radiation image therein, said cassette comprising a lining member secured to the inner surface of a rear cover of said cassette, said lining member comprising a cushioning material layer and a resin material layer, the surface of said resin sheet facing said phosphor sheet being embossed, whereby said phosphor sheet may be smoothly inserted into said cassette and said sheet will not stick to the inner surface of said rear cover upon opening said cassette for removal of said sheet.

4,681,228

PACKAGE FILLED WITH A WATER-SOLUBLE TOXIC PULVERULENT OR GRANULAR PRODUCT

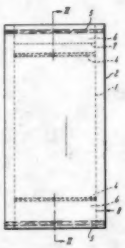
Peter R. Kerry, Burpham, and Jeffrey L. Lewis, Farnham, both of Great Britain, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Jan. 13, 1986, Ser. No. 818,492

Claims priority, application Netherlands, Jan. 14, 1985, 8500076

Int. Cl.[4] B65B *11/58, 47/00;* B65D *85/82*

U.S. Cl. 206—484 20 Claims



1. A package for a water-soluble pulverulent or granular product comprising an inner container for said product formed from a flexible tube of a water-soluble film having two ends, each of said ends being closed by a transverse joint located near each end, and each of said ends being provided with an end strip, characterized as an extension of the flexible tube from said transverse joint to said end, one of said end strips having a perforated tear line therein intermediate the transverse joint and said end; an outer container surrounding said inner container with product, said outer container being formed from a flexible tube of a water-resistant material having two ends, each of which is closed by a transverse joint placed near said end; and wherein each end of said inner container is attached to the outer container at each transverse joint of said outer container.

13. A device for the manufacture of a package of a water-soluble pulverulent or granular product comprising a first filling pipe, means for providing a metered supply of product to said first filling pipe, means for placing around said first filling pipe a first continuous flexible tube of film, first sealing means for making a transverse joint across said first tube to form a package while leaving a first end strip, filling means to deposit a measured quantity of said product in said package, means for closing said package by making a transverse joint in said first tube above said product while leaving a second end strip in said first tube, and perforating means for making a tear line in the second end strip; and a second filling pipe for receiving the filled and closed first tube, means for placing a second continuous tube of film around the second filling pipe, and sealing means for forming a transverse joint across both the first and second tube at each end of the first tube.

19. A method of manufacturing a filled package in which a water-soluble pulverized or granular product is contained in a closed water-soluble inner container placed inside and attached to a closed water-resistant outer container comprising the steps of:

(a) forming around a filling tube a first continuous flexible tube of water-soluble film,

(b) forming a transverse joint across the tube below the filling tube to form a first closure in the first tube,

(c) filling the first tube with a metered amount of the product;

(d) forming a second transverse joint to seal said first tube and to provide an end strip therein;

(e) perforating the end strip to form a tear line therein;

(f) forming a second continuous flexible tube of water-insoluble film around the first tube; and

(g) forming first and second transverse joints across the first and second tubes to provide closures to the second tube, while at the same time attaching the ends of the first tube to the second tube.

4,681,229

NOTE SORTING AND COUNTING APPARATUS

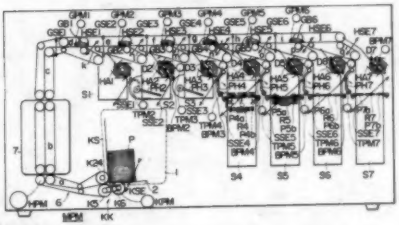
Sadaaki Uesaka; Toshio Numata, and Kazunori Umezaki, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Nov. 20, 1984, Ser. No. 673,314

Claims priority, application Japan, Dec. 12, 1983, 58-233899; Dec. 12, 1983, 58-233900; Dec. 12, 1983, 58-233901

Int. Cl.[4] B07C *5/34;* G06M *7/06*

U.S. Cl. 209—534 12 Claims



1. A note sorting and counting apparatus comprising:

ejecting means for ejecting notes one by one from a stack of notes;

identifying means for identifying the notes ejected by said ejecting means, the identification in connection with each note being at least as to whether the note is obverse or reverse and as to the denomination of the note;

sorting means for sorting the notes successively ejected by said ejecting means into groups comprising obverse notes of the respective denominations and a group comprising reverse notes, in accordance with the result of the identification made by said identifying means;

a plurality of containers, one container alloted to each of the respective groups;

said sorting means directing each note to the container alloted to the group to which the particular note belongs;

some individual containers of said plurality of containers including a retaining section for receiving and retaining the notes directed to the particular individual container and allowing the notes retained therein to be taken out, a storage section, and transfer means for transferring notes from the retaining section to the storage section, each of said individual containers being provided with a sensor for detecting notes in the retaining section;

mode switch means for selecting the operation mode of the apparatus from a plurality of operation modes, one of the operation modes being a batch processing mode in which notes are sorted and counted into batches each consisting of a predetermined number of notes;

an approval key for commanding transfer of notes from the retaining sections to the respective storage sections of said individual containers; and

control means for controlling operation of said ejecting means when the batch processing mode is selected in such a manner that when a second predetermined number of notes is sensed by one of said sensors said ejecting means is stopped, and when said one of said sensors senses that notes in the associated individual container retaining section have been taken out, said ejecting means is re-started, and for causing operation of said transfer means to transfer notes from the retaining sections into the storage sections

in response to the actuation if said approval key when the batch processing mode is not selected.

4,681,230

TUBE TRANSFER DEVICE

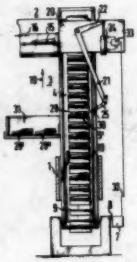
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 725,015

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414680

Int. Cl.[4] B07C *5/36*; B65H *67/06*

U.S. Cl. 209—615 **13 Claims**



1. Tube transfer device for discarding unusable cylindrical and conical tubes and misoriented conical tubes and for transferring empty cylindrical tubes and properly oriented conical tubes from a tube feeding device to a tube receiving device, comprising an elevator advancing tubes in a given transport direction from the tube feeding device to the tube receiving device in intermittent steps with pauses between the steps, said elevator having receiver elements for individual tubes, a feeler element movable back and forth transverse to said given transport direction at an operating height during said pauses, said feeler element passing over empty cylindrical tubes and empty conical tubes oriented in a given direction and pushing unusable cylindrical and conical tubes and conical tubes oriented opposite to said given direction out of said receiver elements, and a receiver device adjacent said elevator for receiving the pushed-out tubes from said receiver elements, said feeler operating in a given direction, and said feeler being formed of a plurality of pivotally supported thin plates ending at a point and forming an acute angle in said given operating direction toward a tube disposed in one of said receiver elements.

4,681,231

ARTICLE SELECTING AND CONVEYING SYSTEM

Yutaka Ueda, Nara, and Masaharu Kiriake, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 2, 1983, Ser. No. 557,068

Claims priority, application Japan, Dec. 8, 1982, 57-186217[U]; May 25, 1983, 58-93262

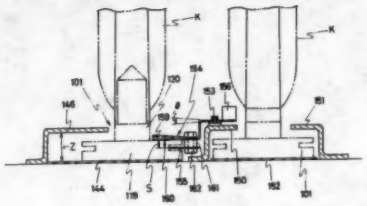
Int. Cl.[4] B07C *5/36*

U.S. Cl. 209—656 **8 Claims**

1. An article selecting and conveying apparatus for selecting different kinds of articles comprising a conveying passage and a carrier which is transferred on the conveying passage and supports an article thereon, said carrier being formed with a discrimination means for discriminating the kind of article placed on said carrier,

wherein said articles are cops nd said apparatus is provided in a system which comprises a plurality of spinning frames, an automatic winder divided into a plurality of winding sections for winding up different kinds of cops at each winding section, a cop supplying passage communicating the spinning frame to the winder and conveying said carriers on which different kinds of cops fed from the spinning frames are placed on, and an ejecting passage for conveying carriers ejected from the winder to the spinning frame,

said conveying passage being formed in the cop supplying passage and comprising a belt conveyor and guide members for guiding said carriers; said discrimination means comprising one or more discriminating grooves formed in the carrier at predetermined positions corresponding to the kind of articles placed on said carrier; and a discriminating member positioned to allow passage of at least one



of said grooves therearound to thereby discriminate said carrier based upon the position of said grooves, and

wherein there is further disposed in said conveying passage a guide and distribution device for guiding the carrier, which has been discriminated by said discriminating member, to a conveying passage especially for said carrier so that each of said carriers are selected and distributed to the conveying passage therefor in dependence upon the presence of the discriminating groove corresponding to said discriminating member.

4,681,232

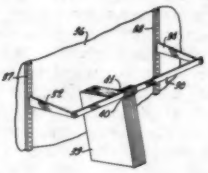
PERIODICAL HANGING SYSTEM AND APPARATUS

Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Nov. 23, 1984, Ser. No. 674,288

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—46 **30 Claims**



1. A hanger for periodicals, such as magazines, journals, and the like, having a spine, said spine having a top, a bottom, and inner and outer sides, said hanger comprising

an elongated hanger member having first and second hanger member ends adapted to extend along one of said spine sides in close proximity to said spine, with said hanger member ends respectively adjacent said top and bottom of said spine,

a spine carrier element connected to said hanger member at said second hanger member end,

said spine carrier element having a first leg extending outwardly from said hanger member and adapted to extend beneath the bottom of said periodical spine to thereby support the periodical on said first leg,

said spine carrier element having a second leg extending upwardly from an outer part of said first leg and adapted to extend along the other side of said spine to

thereby retain the bottom of said spine upon said spine carrier element,

a spine retainer element at said first hanger member end and extending downwardly therefrom,

means for connecting said spine retainer element to said first hanger member end,

said spine retainer element being adapted to extend along said other side of said spine to hold the top of said spine at said spine carrier, and

suspension means on said hanger member at said first hanger member end for suspending said hanger and a periodical supported thereon from a single point,

said second leg of said spine carrier element comprising an elongated retaining strip connected to said first leg of said spine carrier element and extending along said elongated hanger member for substantially the full length of said hanger member,

said retaining strip having an upper end comprising a portion of said spine retainer element,

said elongated hanger member having a closure member fixed to an upper end thereof and projecting outwardly therefrom,

said closure member and the upper portion of said retaining strip collectively defining said spine retainer element, the upper end of said retaining strip being detachably connected to said closure member.

4,681,233

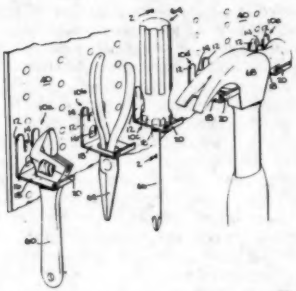
PEGBOARD MOUNTED TOOL HOLDER

Howard Roth, 206 Devoe Ave., Yonkers, N.Y. 10705

Filed Apr. 21, 1986, Ser. No. 854,300

Int. Cl.[4] A47F *5/08*

U.S. Cl. 211—70.6 **18 Claims**



1. A holder of unitary construction for holding tools on a pegboard mounting surface, comprising:

a vertical leg having two tabs extending upwardly away from said vertical leg of said holder and substantially parallel to one another to engage and secure said holder to a mounting surface behind said holder by means of an interference fit;

a horizontal leg, extending substantially perpendicular outwardly from said vertical leg, having a hole therein; and

a lip extending upward from said horizontal leg.

4,681,234

WRENCH RACK

Mark S. Wisnieswski, 38 Milk St., Blackstone, Mass. 01504

Filed Mar. 12, 1986, Ser. No. 838,905

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—70.6 **6 Claims**

1. The combination comprising

a wrench rack, and

T-shaped wrenches supported by said rack,

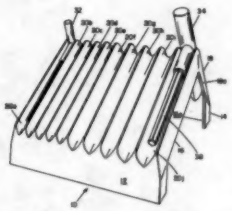
said wrenches having shanks and handles perpendicular to said shanks,

said combination comprising

a front portion extending upwardly and rearwardly,

a back portion extending downwardly and rearwardly,

a multiplicity of grooves extending upwardly in said front portion and then downwardly in said back portion, said grooves intersecting at the top of said rack at an angle of 90°,



said grooves being open along their lengths to facilitate access to them,

said grooves in said front portion being sufficiently long, and said front portion being positioned, to accommodate said shanks of said wrenches therein,

said grooves in said back portion being sufficiently long, and said back portion being positioned, to accommodate said handles of said wrenches.

4,681,235

ELASTIC ARTICULATION OF A CENTRAL BUFFER COUPLING FOR RAIL VEHICLES

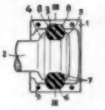
Hilmar Forster, Wolfenbuttel, and Harald Lindner, Salzgitter, both of Fed. Rep. of Germany, assignors to Scharfenbergkupplung GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,017

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345381; Jun. 7, 1984, 3421166

Int. Cl.[4] B61G *9/06*

U.S. Cl. 213—50 **1 Claim**



1. An elastic articulation of a central buffer coupling for rail vehicles, comprising a housing adapted to be secured on the vehicle, a drawbar traversing said housing, at least one oval ring of resilient material prestressed normal to the axis of said coupling arranged between said housing and said drawbar, said drawbar as well as the inside of said housing having peripheral cams directed toward each other, said housing and said drawbar having oval crosssections with their axes disposed vertically, said rings being held spaced by said cams, and wherein said housing, said ring as well as said drawbar have a major axis of their cross-section disposed in the vertical in their installed position.

4,681,236

DRINKING GLASS HAVING A PRESS-MOLDED STEM AND A BASE (OR PEDESTAL)

Emil Ilk, Industriezeile 24, A-5280 Braunau am Inn, Austria

Filed Oct. 22, 1985, Ser. No. 790,273
Int. Cl.[4] A47G *19/22*; C03B *11/00*
U.S. Cl. 215—99.5 5 Claims

1. A drinking glass comprising:

a bowl;

a base;

a press-molded stem intermediate the bowl and the base and integrally formed therewith, and having a maximum thickness substantially greater than a maximum thickness of the bowl and of the base; and

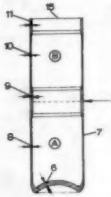
said stem including means defining at least one stress-relieving passageway extending therethrough in a generally transverse, horizontal direction.

4,681,237

METHOD FOR THE MANUFACTURE OF METAL PACKAGING CANS, AND A SEMI-PRODUCT IN THE MANUFACTURE OF SUCH CANS

Leo Hartman, Beverwijk, Netherlands, assignor to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Mar. 23, 1984, Ser. No. 592,786
Claims priority, application Netherlands, Mar. 28, 1983, 8301069
Int. Cl.[4] B65D *6/34*
U.S. Cl. 220—70 3 Claims



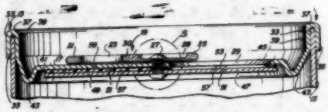
2. Semi-product in the manufacture of steel metal packaging cans, consisting of a seamless tube having at one end a bottom formed in one piece with the tube, the tube and bottom being obtained by deep-drawing and subsequent ironing of the tube over at least part of its length, said tube being of a length such that it constitutes, connected to each other, a cylindrical body and bottom of a two piece can and at least one cylindrical body of a three-piece can, wherein the wall-thickness of the tube is, adjacent the end remote from the bottom and at the or each location, of connection of two of said can bodies, greater than at other regions (excluding the bottom), the regions of greater thickness being suitable for the formation of flanged connections of top and, as appropriate, bottom walls of the cans.

4,681,238

RE-CLOSURE DEVICE FOR POP TOP CONTAINERS

Ruben G. Sanchez, 9234 S. Heather Dr., Tempe, Ariz. 85284

Filed Oct. 3, 1986, Ser. No. 914,829
Int. Cl.[4] B65D *17/50, 41/02*
U.S. Cl. 220—260 14 Claims



1. A resealable beverage container having an interior for containing beverages, a top lid, a lid opening for egressing liquid from within the interior of the container, and a conventional pop top means including a tab lever member, said resealable beverage container comprising:

an original sealing member operatively disposed within the interior of said container flush beneath said lid opening for forming an air-tight seal between the interior of said container and said lid opening;

a resealing member operatively disposed within the interior of said container and integral with said original sealing member and connected thereto for rotation therewith;

rivet means for operatively coupling a conventional pop top tab member lever onto the lid of the container, said rivet means being operatively coupled to the junction of said first and second integrally connected original sealing and resealing members and to an intermediate portion of said tab member;

one end of said tab member being responsive to a lifting force applied to the opposite end portion thereof for pivoting said tab member lever about said rivet means and forcing said original sealing member out of sealing engagement with said lid opening and bending same down into the interior of said container; and

at least said resealing member being responsive to the rotation of said tab member lever in a first direction after said lid opening is unsealed for sliding said sealing member along the inner surface of the lid of said container and repositioning same immediately beneath said lid opening for sealing said lid opening in a liquid-tight manner to prevent the escape of carbonated gases therefrom thereby preventing the remaining beverage within the interior of said container from going flat, said resealing member being responsive to the rotation of said tab member lever in the opposite direction for opening and unseating said sealing member and uncovering said lid opening to permit the beverage remaining therein to be poured therefrom.

4,681,239

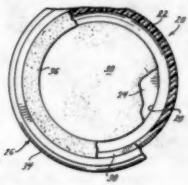
HOLDER FOR CONTAINER FOR LIQUID

Michael C. Manns, and Terry E. Roberts, both of Festus, Mo., assignors to Roman Products, Inc., De Soto, Mo.

Filed Aug. 7, 1986, Ser. No. 894,379
Int. Cl.[4] B65D *23/08, 81/38*; A47J *41/00*
U.S. Cl. 220—408 3 Claims

1. An insulating holder, for releasably holding a container for liquid, which comprises an elongated, annular, side wall and a bottom that coact to define an elongated, generally-cylindrical recess which has an inner diameter that is larger than the diameter of said container, an axial dimension that is shorter than the axial dimension of said container, and an open end through which the container is insertable into said recess, an annular sealing member of a resiliently-compressible cellular material disposed upon said side wall at an upper end portion thereof for sealing against a confronting portion of the

container, a sump recessed formed in the bottom wall of the container, said sump recess having a peripheral wall of a lesser diameter than the inner diameter of the side wall of the holder and opening into the generally cylindrical recess, a pad of resiliently compressible cellular material, a lower end of said pad being disposed in said sump recess and an upper portion thereof projecting upwardly from the sump recess into the



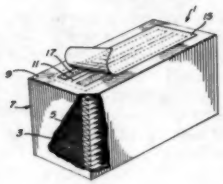
generally cylindrical recess, and a water-resistent cement applied about the periphery of said pad in a manner securing the pad to the peripheral wall of the sump recess, said cement serving as a means for stiffening the pad sufficiently to enable the pad to hold the bottom of the container above, and out of engagement with, the bottom of the holder, thereby enabling condensate traveling down the container to be effectively absorbed by the pad and collected in said sump recess.

4,681,240

TOWELLING PACKAGE

James A. Wyant, 321 Lanthier Ave. #409, Pointe Claire, Quebec, Canada H9S 5K6

Filed Dec. 12, 1985, Ser. No. 808,072
Int. Cl.[4] A47K *10/24*
U.S. Cl. 221—48 **2 Claims**



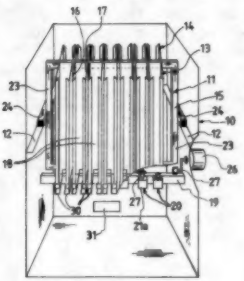
1. A dispensing package for paper towels, comprising:
a stack of interleaved paper towels;
a wrapper enclosing the stack of towels and having a substantially flat top;
a towel dispensing slit extending in an approximate straight line in the approximate center of the top of the wrapper for use in manually removing the towels from within the wrapper one at a time;
two tacky adhesive layer strips on the outer surface of the top of the wrapper extending substantially parallel to the slit and for the same length as the slit, the adhesive layer strips located one on each side of the slit in a position to leave a narrow space on the outer surface of the top of the wrapper between the slit and each of the adhesive layer strips, one of the two adhesive layer strips releasably retaining a towel that is pulled part way out of the wrapper by a previously dispensed towel and that falls over the top of the wrapper thereby preventing the towel from falling back within the wrapper, the adhesive layer strips positioned relative to the slit to retain the towel by its fallen-over, horizontal portion rather than by any vertical portion of the towel extending down within the wrapper, and a removable cover sheet extending over the slit and the two adhesive layer strips, initially releasably held to the outer surface of the top of the wrapper by the two adhesive layer strips to cover the slit and protect the two adhesive layer strips.

4,681,241

VENDING MACHINE

Lars Olofsson, and Martin Hospers, both of Gothenburg, Sweden, assignors to AB Betjänten, Sweden

PCT No. PCT/SE84/00069, § 371 Date Oct. 22, 1984, § 102(e) Date Oct. 22, 1984, PCT Pub. No. WO84/03425, PCT Pub. Date Sep. 13, 1984
PCT Filed Feb. 28, 1984, Ser. No. 675,836
Claims priority, application Sweden, Mar. 2, 1983, 8301149
Int. Cl.[4] B65G *59/00, 3/44*
U.S. Cl. 221—124 **6 Claims**



6. A hopper for insertion in the casing of a vending machine provided with tilting means and feeding-out means, and comprising:
(A) a generally rectangular carrier frame defined by top, bottom, and side members;
(B) a number of goods receiving pockets mounted back to back in said carrier frame,
(C) said carrier frame at each of its side members having a transversely fitted, elongate support member for tilting engagement with said casing, said frame further offering a contact surface for said tilting mechanism;
(D) each of said hopper pockets is provided with side walls which are resilient transversely to the vertical extension of the pocket, and each being continued by portions of a front wall, said portions define a vertical slot running along the front wall.

4,681,242

SOLVENT PUMP

Robert Sirkin, Fullerton, Calif., assignor to Charles Wyle Engineering Corporation, Torrance, Calif.

Filed Sep. 5, 1985, Ser. No. 773,001
Int. Cl.[4] B67D *5/22*; G01F *11/00*
U.S. Cl. 222—41 **1 Claim**

1. A solvent pump comprising:
a. a mainframe member;
b. said mainframe member comprising a base plate, a first side plate member, a second side plate member, a top plate member and a clutch mounting plate member;
c. said first side plate member being supported on said base plate and extending perpendicularly thereto;
d. the top of said first side plate member supporting said top plate member such that the top plate member is disposed perpendicularly to the first side plate member and generally parallel to said base plate;
e. said second side plate member being supported on said base plate, extending perpendicularly thereto and further adjoining and running perpendicular to said first side plate member;
f. said clutch mounting plate member supported on said second side plate member at a distance below the top of

the second side plate member such that the clutch mounting plate member is disposed generally perpendicular to the second side plate member and extending generally parallel to said base plate;

g. said top plate member containing a slotted opening;

h. a solvent reservoir resting on top of said top plate member and connected thereto by means of a first hollow coupling member inserted through the slotted opening in the top plate member;

i. said first hollow coupling member comprising a first valve assembly;

j. a second hollow coupling member having two ends, connected at one of its ends to one end of said first hollow coupling member by means of tubing;

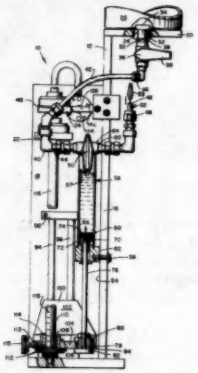
k. said second hollow coupling member comprising a threaded pipe assembly and a three way valve assembly;

l. said second hollow coupling member having a solvent ejection nozzle fixed to its other end;

m. a hollow solvent cylinder disposed generally parallel to and set a short distance apart from said first side plate member;

n. said hollow solvent cylinder comprising an internal chamber;

o. said hollow solvent cylinder attached to said second hollow coupling member adjacent said three way valve assembly such that an internal channel provides a passage-



way from the three way valve assembly to the internal chamber of the hollow solvent cylinder;

p. a piston located within the internal chamber of said hollow solvent cylinder;

q. said piston comprising a head portion which in turn comprises a circumferential groove housing a sealing ring and an extension portion;

r. a piston rod connected at its upper end to said extension portion of the piston and connected to a rod end coupling member at its lower end;

s. said rod end coupling member being a generally H-shaped member with an upper face to which said piston rod is connected, a lower face, and a recessed mid-portion;

t. a first stationary rod and a second statioary rod disposed generally parallel to each other and generally parallel to said second side plate member;

u. said first and second stationary rods attached to said second side plate member;

v. a movable slide member movably attached to said first and second stationary rods;

w. said movable slide member affixed to an angle bracket member which comprises a vertical portion attached to the movable slide member and a horizontal portion extending perpendicularly thereto;

x. the horizontal portion of said angle bracket member containing a transverse opening;

y. a T-shaped lead nut having a horizontal portion and a vertical portion, said T-shaped lead nut being movably inserted through the transverse opening in the horizontal portion of said angle bracket member;

z. the horizontal portion of the T-shaped lead nut pressing against the surface of the horizontal portion of said angle bracket while the vertical portion of the T-shaped lead nut extends through the transverse opening;

aa. the vertical portion of said T-shaped lead nut containing an internally threaded shaft;

bb. securing means capable of causing said T-shaped lead nut to become attached to and move with said angle bracket member when tightened and permitting the T-shaped lead nut to move independently of the angle bracket member when loosened;

cc. said angle bracket member being joined to said rod end coupling member such that the horizontal portion of said angle bracket abuts the recessed mid-portion of the rod end coupling member and is sandwiched between the upper face and the lower face of the rod end coupling member;

dd. said clutch mounting plate member containing a transverse opening;

ee. a threaded rod disposed generally parallel to said first and second side plate members, connected into the internal shaft of said T-shaped lead nut at its lower end and extending through the transverse opening in said clutch mounting plate at its upper end;

ff. a first one-way clutch attached adjacent the upper portion of said threaded rod and movably supported by said clutch mounting plate member;

gg. a second one-way clutch attached at the upper portion of said threaded rod;

hh. said first one-way clutch and said second oneway clutch permitting the threaded rod to rotate in the same direction;

ii. a movable lever arm assembly attached to the lower extremity of said second one-way clutch;

jj. said movable lever arm assembly comprising a base portion attached to said rod and to said second one-way clutch and an arm portion extending generally parallel to the base plate and toward said first side plate member;

kk. a slotted opening in said first side plate member which permits the arm portion of said movable lever arm assembly to pass therethrough and to move in a transverse direction within the first side plate member;

ll. a spring support member attached to said first side plate member;

mm. a return spring attached to the tip of the arm portion of the movable lever arm assembly at one end and attached to and supported by the spring support member at its opposite end;

nn. a stop block attached to the arm portion of the movable lever arm assembly at a location adjacent the internal face of the first side plate member;

oo. a first adjustable arm stopping means supported on said second side plate member and extending toward said stop block;

pp. a second adjustable arm stopping means supported on said spring support member and extending towards said stop block such that the stop block is located betewen the first and second adjustable arm stopping means;

qq. an air cylinder attached to the internal face of said second side plate member at a location aligned with the arm portion of the movable lever arm assembly;

rr. said air cylinder comprising a movable tip aligned with and set a short distance from the arm portion of said movable lever arm assembly;

ss. a directional air valve located adjacent the outer face of said second side plate member and connected to said air cylinder by air intake and air exhaust tubing members;

tt. a solvent pump start means connected to said directional air valve;

uu. a signalling means comprising upper and lower exterior

surfaces and an activating switch fixed to said lower surface of said signalling means, located on the outer face of said second side plate member at a location between said base plate and said clutch mounting plate member;

vv. said second side plate member further comprising an elongated vertically disposed internal slot extending from adjacent said base plate to adjacent the activating switch on said signalling means; and

ww. a switch activating member attached to said slide member movably supported by said stationary rods, extending through said elongated vertically disposed internal slot and aligned with said activating switch;

xx. whereby when said solvent reservoir is filled with solvent, said first valve assembly is rotated to the open position so that solvent may flow through said first hollow coupling member to said second hollow coupling member and said three way valve assembly is opened to permit solvent to flow from said second hollow coupling member to the internal chamber of said hollow solvent cylinder, said Tshaped nut is permitted to move independently of said angle bracket member and is screwed downwardly on said threaded rod until it is adjacent said base plate, thereby permitting said angle bracket member to be moved downwardly to adjacent said base plate which action causes said rod end coupling member to move with the angle bracket member thereby moving said piston rod in a downward direction and causes said piston to move downwardly inside said hollow solvent cylinder until said piston is at the bottom of the internal chamber, the downward movement of the piston creating a suction effect to permit the internal chamber to be filled with solvent, said first valve being thereafter closed and said three way valve assembly being adjusted so that solvent may flow from said internal chamber to said solvent ejection nozzle, activating said solvent pump start means which causes said directional air valve to force air into said air cylinder on the air intake cycle which in turn causes said movable tip to move toward and push the arm portion of said movable lever arm assembly to thereby cause the arm portion to move by a predetermined amount based upon the settings of said first and second adjustable arm stopping means, which movement further causes rotation to said second one-way clutch which in turn causes said threaded shaft to rotate by a given amount which in turn causes said T-shaped nut to rotate on said threaded rod by the same amount which in turn causes said angle bracket member to move which in turn causes said rod end coupling member to move which in turn causes said piston to move and displace a selected amount of solvent from the internal chamber which solvent then exits the chamber and is ejected through the solvent ejection nozzle, the air pressure then being removed from said air cylinder on the exhaust cycle to thereby permit said return spring to return the movable lever arm assembly to its original position while the threaded rod remains stationary due to the action of the other one way clutch, and wherein the cycle is caused to be repeated over again in repetitive fashion until the switch button activator member has been moved by a sufficient distance to activate the signalling means.

4,681,243

CARTRIDGE WITH PLUG OPENING MECHANISM

Mitsuo Takasugi, Yokohama, Japan, assignor to Colpo Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 708,058

Claims priority, application Japan, Mar. 7, 1984, 59-43511; Mar. 7, 1984, 59-43512

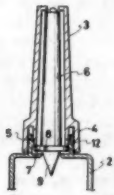
Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—83 **5 Claims**

1. A cartridge containing a dispensable material and having a dispensing end with a plug opening mechanism, comprising:

a plug member mounted on the dispensing end of the cartridge, and having an annular male connecting region at its upper portion;

a hollow nozzle member having a lower end and an upper apertured end, said lower end having a seat portion formed as double annular walls and including a threaded female screw on the inner side of the outer wall of the double annular walls, said seat portion being secured to the plug member by mounting said female screw on the male connecting region; and



a drill holding member extending within the hollow portion of the nozzle, said drill holding member having an upper end portion for closing the aperture at the upper end of the nozzle, and further having, at a lower end portion thereof, an annular collar having a plurality of spaced, radially extending notches, said collar supporting a downwardly depending drill.

4,681,244

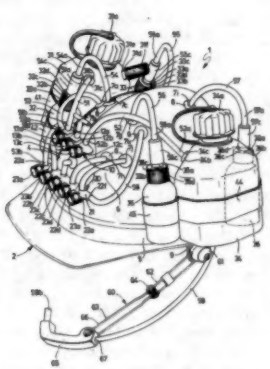
PORTABLE BAR

John D. Geddie, 832 Walnut St., Charlotte, Mich. 48813

Filed Apr. 30, 1986, Ser. No. 857,264

Int. Cl.[4] B67D *1/00*

U.S. Cl. 222—144.5 **2 Claims**



1. A portable bar comprising a hat adapted to receive a plurality of drink containers and a plurality of valves detachably mounted thereon; a first drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said container being adapted to receive a tube inserted therein; a second drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said container being adapted to receive a tube inserted therein; a third drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a fourth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted

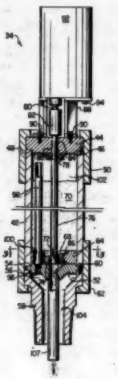
therethrough; a fifth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a sixth drink container coupled to the hat by suitable attachment means and having provided thereon a cap adapted for closing the said container, the said cap being adapted to receive a tube inserted therethrough; a first gang valve coupled to the hat by suitable attachment means, the said gang valve having a first mixing chamber, the said first mixing chamber having extending therefrom a first port, a second port, a third port, and a fourth port wherein the first port is provided with a first valve adapted to be controlled by a knob and the said second port is provided with a second valve adapted to be controlled by a knob and the said third port is provided with a third valve adapted to be controlled by a knob, and wherein each of the said ports communicates with the said first mixing chamber and is adapted to convey a drink into or out of the said first mixing chamber and wherein the said first, third and fourth ports is each adapted to receive a tube detachably coupled thereto, and wherein the said second port is adapted to vent the said first mixing chamber to the atmosphere; a second gang valve coupled to the hat by suitable attachment means, the said gang valve having a second mixing chamber, the said second mixing chamber having extending therefrom a fifth port, a sixth port, a seventh port, an eighth port, a ninth port and a tenth port wherein the said fifth port is provided with a fourth valve adapted to be controlled by a knob and the said sixth port is provided with a fifth valve adapted to be controlled by a knob and the said seventh port is provided with a sixth valve adapted to be controlled by a knob and the said eighth port is provided with a seventh valve adapted to be controlled by a knob and the said ninth port is provided with an eighth valve adapted to be controlled by a knob, and wherein each of the said ports communicates with the said second mixing chamber and is adapted to convey a drink into or out of the said second mixing chamber and wherein each of the said ports is adapted to receive a tube detachably coupled thereto; a first tube having two ends wherein the first end is inserted into the first drink container and wherein the second end is coupled to the first port; a second tube having two ends wherein the first end is inserted into the fourth drink container and wherein the second end is coupled to the third port; a third tube having two ends wherein the first end is coupled to the fourth port and wherein the second end of the third tube is coupled to the fifth port; a fourth tube having two ends wherein the first end is inserted into the third drink container and wherein the second end is coupled to the sixth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the third drink container; a fifth tube having two ends wherein the first end is inserted into the fourth drink container and wherein the second end of the fifth tube is coupled to the seventh port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the fourth drink container; a sixth tube having two ends wherein the first end is inserted into the fifth drink container and wherein the second end of the sixth tube is coupled to the eighth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the fifth drink container; a seventh tube having two ends wherein the first end is inserted into the sixth drink container and wherein the second end of the seventh tube is coupled to the ninth port, the said tube being provided with a check valve inserted therein adapted to prevent drink from flowing into the sixth drink container; an eighth tube having two ends wherein the first end is coupled to the tenth port and wherein the said tube is routed to the front of the hat and is adapted to be supported by an articulated boom; and a bracket attached to and depending from the hat and having pivotally coupled thereto an articulated boom adapted to support the said eighth tube.

4,681,245

METHOD AND APPARATUS FOR DISPENSING OIL WELL PROPPANT ADDITIVE

Robert D. Harvey, Rte. 3, Box 177AA, Kilgore, Tex. 75662

Filed Mar. 25, 1985, Ser. No. 715,671
Int. Cl.[4] G01F *11/24*
U.S. Cl. 222—643 **8 Claims**



1. Sealed apparatus for accurately dispensing an additive into a pressurized stream of well proppant, the apparatus comprising:

a sealed housing connected to the stream, and including a chamber for containing the additive in a position between said chamber and the pressurized stream;

a stationary auger ring sealed to the interior of said chamber;

movable additive dispensing means disposed internal to said apparatus between said chamber and the pressurized stream, and movable within said auger ring from a first position in which the flow of additive is shut off and the chamber is sealed from the pressurized stream, to a second position in which said chamber is in communication with said pressurized stream so that the additive in said chamber can be dispensed into the stream, said dispensing means forming the bottom of said container upon which the additive rests;

drive means for moving said dispensing means;

a pressure equalizing conduit disposed within said sealed housing extending from said additive chamber through said auger ring and in communication with the stream of well proppant, said pressure equalizing conduit equalizing the fluid pressure existing in the pressurized stream with the fluid pressure existing in said chamber.

4,681,246

SKI HOLDING DEVICE

Denny Andersson, Vistavarvsvägen 163, 122 43 Enskede, Sweden

Filed Nov. 21, 1985, Ser. No. 800,210
Claims priority, application Sweden, Nov. 21, 1984, 8405866
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—267 **5 Claims**

1. A ski holding device to be utilized for carrying skis, especially skis for downhill running, characterized in that the ski holding device comprises an upwardly open box (2;21;28), with a bottom wall portion, front and rear walls and side walls, to be placed on the outside of a boot, which box has a horizontal interior cross-section, which is essentially rectangular and as to the width and, respectively, length exceeds the thickness and, respectively, width of the blunt ends of a pair of skis, into which box the blunt ends of a pair of skis are intended to be slipped down and supported by said bottom wall portion

(8;22;32); the interior of said bottom wall portion including a ridge (9), intermediate and spaced away from said front and rear walls of said box and extending transverse to the side walls of said box, said ridge constituting a pivot abutment upon which an intermediate surface portion of said blunt (rear) ends of the pair of skis are intended to rest; and said bottom wall

portion include apertures (10,11), one located in each of the spaces between said ridge and said front and rear walls of the box and thus being front and rear apertures respectively, each said aperture having a size enabling associated rear corner portions of the blunt ends of a pair of skis, placed in said box, to project down into and through an associated front or rear aperture.

4,681,247

LOAD SUPPORT PEDESTAL

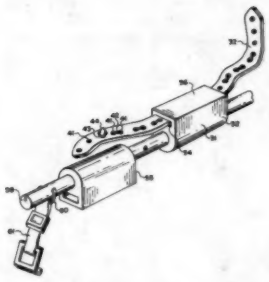
Gildo G. Prosen, 7071 Belden St., San Diego, Calif. 92117

Continuation of Ser. No. 655,628, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 459,323, Jan. 20, 1983, Pat. No. 4,483,471. This application Mar. 26, 1986, Ser. No. 843,837

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—322 **10 Claims**



1. A load carrying system adapted for attachment to a vehicle by straps under tension, having a support member with a transverse opening slidingly receiving an intermediate load-bearing tube, said support member having side and end walls, a base and a top opposite said base, the improvement comprising, in combination:

said intermediate load bearing tube having a round cross-section, and engaging at least two of said load support members;

said intermediate load bearing tube adapted for carriage of a load borne thereon;

said bases of said load support members engaging a body panel of said vehicle;

said load support member having an elastomeric body in which there is a transverse opening of circular section, said transverse opening rotatably engaging said intermediate tube and said elastomeric body, said load support member incorporating a base of a width equal to a dimension of the distance from the center of said transverse opening to the point at which said load supporting surface intersects with the side walls of said load support member, said load supporting member having end walls adjacent to said side walls and a semi-cylindrical top surface joining said side walls and surrounding said transverse opening

said tube engaging at least one additional load supporting member adapted to directly support loads borne by the system, having a transverse opening slidably and rotatably engaging the intermediate load bearing tube, having side and end walls, a base and a top opposite said base, said load support member having at least one rectangular section slot of width equivalent to the diameter of said transverse opening, in an elastomeric body.

4,681,248

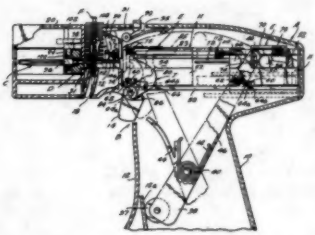
TAG DISPENSING AND ATTACHING METHOD AND APPARATUS

Daniel Duchin, Wantagh, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 654,062, Sep. 25, 1984, Pat. No. 4,610,384, which is a continuation-in-part of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385. This application Feb. 14, 1986, Ser. No. 829,245

Int. Cl.[4] B31F *7/00*

U.S. Cl. 227—73 **7 Claims**



1. Apparatus for feeding tags and attaching same to an article by means of a fastener comprising a hand-held tag attacher comprising a manually actuatable actuator, a needle for dispensing fasteners, means, adapted when actuated, for mounting said needle for movement between retracted and extended positions, means, adapted when actuated, for feeding a tag into alignment with said needle, and means for operably mechanically connecting said tag feed means, said needle mounting means, and said actuator, said connecting means comprising means responsive to a single actuation of said actuator to feed a fastener into said needle, to actuate said tag feed means to move a tag into alignment with said needle and to actuate said needle mounting means to move said needle from said retracted position to said extended position.

4,681,249

VAPOR PHASE SOLDERING APPARATUS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 870,897

Claims priority, application Japan, Jun. 8, 1985, 60-123517; Jun. 8, 1985, 60-123518; Oct. 28, 1985, 60-239348; Jan. 20, 1986, 61-7876

Int. Cl.[4] B23K *1/12*

U.S. Cl. 228—37 **6 Claims**

1. An apparatus for soldering printed circuit boards having

electric components mounted thereon with solder preforms, comprising:

a closed vessel for containing a heat transfer liquid having a boiling point higher than the melting of the the solder preforms;

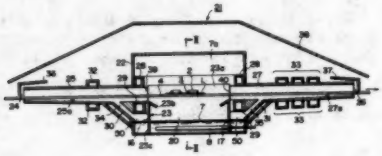
vertical partition means provided within said vessel for dividing the inside space of said vessel into an inner, heating chamber defined by said partition means and an outer, cooling chamber defined between said partition means and said vessel;

an opening provided in a lower portion of said partition means so that the heat transfer liquid in said cooling chamber may enter said heating chamber therethrough;

front and rear apertures provided in upper portions of said partition means to allow the passage of the printed circuit boards therethrough;

heating means provided in said heating chamber to heat the heat transfer liquid in said heating chamber to a temperature higher than the boiling point of the heat transfer liquid;

cooling means provided within said cooling chamber for condensing vapors of the heat transfer liquid in said cooling chamber;



entrance conduit means having an entrance port for printed circuit boards at its one end and connected to said vessel at its the other end;

exit conduit means having an exit port for printed circuit boards at its one end and connected to said vessel at its the other end; and

conveying means adapted for conveying printed circuit boards successively through said entrance port, entrance conduit means, cooling chamber, front aperture, heating chamber, rear aperture, cooling chamber, exit conduit means and exit port,

whereby said heating means heat the heat transfer liquid in said heating chamber to vaporize same and to form saturated vapors of said heat transfer liquid within said heating chamber, the printed circuit boards conveyed by said conveying means through said heating chamber being brought into contact with said saturated vapors so that the solder preforms can melt, and the vapors of said heat transfer liquid which escaped from said heating chamber to said cooling chamber through said front and rear apertures are cooled and condensed by said cooling means in said cooling chamber for recovery.

4,681,250

VAPOR PHASE PROCESSING MACHINE

Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 891,932

Int. Cl.[4] H05K *3/34*; B23K *1/08*

U.S. Cl. 228—37 **4 Claims**

1. A machine for soldering a work product comprising

means for conveying work product through the machine,

applicator means for directing an extended liquid stream of solder against the conveyed work product,

means for pivotally supporting said applicator means for rotation about a horizontal axis and for directing liquid to said applicator means,

a manifold assembly for delivering liquid to said pivotally supporting means including

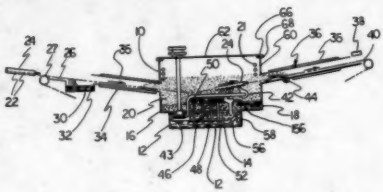
a tubular manifold, and

conduit means for delivering liquid from said tubular manifold to said applicator supporting means, and

means for pivotally supporting said manifold assembly for rotation about an axis parallel to the axis of said applicator means, and

means for rotating said applicator means about its axis including

a bell crank,



means for supporting said bell crank on said manifold assembly supporting means for rotation about the axis of said manifold assembly,

a link member,

means for pivotally connecting one end of said link member to said bell crank and the other end of said link to said applicator means with the points of interconnection defining with the axes of rotation of said applicator means and said tubular manifold a parallelogram so that rotation of said bell crank will rotate said applicator means, and

means for rotating said bell crank.

4,681,251

METHOD OF JOINING NI-BASE HEAT RESISTING ALLOYS

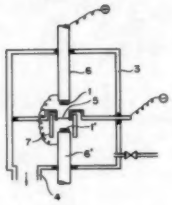
Shuichi Komatsu, Yokohama; Kazumi Shimotori, Kawasaki; Hiromitsu Takeda, Tokyo, and Masako Nakahashi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 386,031, Jun. 7, 1982. This application Oct. 2, 1985, Ser. No. 782,163

Claims priority, application Japan, Jun. 9, 1981, 56-87429; Jun. 9, 1981, 56-87430

Int. Cl.[4] B23K *1/04, 20/24*

U.S. Cl. 228—208 **5 Claims**



1. A method for joining at least two parts which present facing surfaces, said parts comprising a constructional member which is comprised of a Ni-base heat-resisting alloy, comprising the steps of:

(a) forming, by deposition under reduced pressure, a layer consisting essentially of aluminum on at least said facing surfaces of said parts to be joined, wherein said deposition is effected by means of a sputtering method that uses an aluminum filler film separating said parts as an anode and said constructional member as cathode;

(b) bringing said facing surfaces of said parts into contact with each other;

(c) subjecting said parts to a first heating, such that said layer is liquified; and thereafter

(d) subjecting said parts to a second heating, such that aluminum from said layer diffuses into said Ni-base heat-resisting alloy to form a joint between said parts comprising a γ-Ni_3Al phase dispersion, said joint containing substantially no β-NiAl phase.

4,681,252

CARRYING HANDLE FOR CAN CARTON

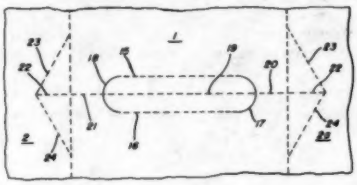
Erwin Doerr, Dunwoody, and Prentice J. Wood, Hapeville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed May 15, 1986, Ser. No. 863,467

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **7 Claims**



1. A carrying handle for a carton for packaging a plurality of articles such as cylindrical cans arranged in at least one tier of cans whose axes are horizontal and having interconnected top, bottom and side walls and end closure panels, said handle comprising a transverse flap formed in said top wall approximately midway between two adjacent cans and having a pair of spaced transverse generally parallel side edges along at least one of which said flap is severable and the other of which is arranged to function as a flap fold line and the ends of said flap being defined by a pair of end slits arranged to interconnect adjacent ends of said side edges respectively, said flap being folded inwardly along said flap fold line to position the entire area of said flap in flat face contacting relation with the inner surface of said top wall and to form a finger receiving aperture in said top wall and to reinforce said top wall and a stress relieving slit formed in each side wall and intersecting the junction between each side wall and the top wall at a point of intersection aligned longitudinally with a part of said transverse flap intermediate its side edges, each stress relieving slit extending from the respective point of intersection to a point on one of said end slits intermediate said side edges.

4,681,253

EFFICIENCY PHOTO-GRAM WITH STAND-UP DISPLAY

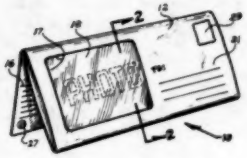
Jonathan A. Engelhardt, Box 90361, San Diego, Calif. 92109

Filed Jul. 11, 1985, Ser. No. 753,917

Int. Cl.[4] B65D *27/04*

U.S. Cl. 229—92.8 **7 Claims**

1. A photo-mailer assembly comprising a unitary sheet of card stock having two generally parallel score lines which divide the sheet into upper, central, and lower panels of substantially equal size, said assembly further comprising inner and outer surfaces, a lateral direction parallel to the score lines and a longitudinal direction perpendicular to the score lines, said central panel including a laterally offset aperture for displaying a photograph, the inner surface of said upper panel including a laterally offset strip of adhesive for securing a photograph thereto in alignment with said aperture, the inner surface of said upper panel including adhesive for securing the inner surfaces of said upper and central panels together in a face-to-face relationship, the inner surface of said lower panel including adhesive for securing the inner surface of said lower panel and the outer surface of said upper panel in face-to-face relationship, the outer surface of said central panel including



indicia for indicating the location of a recipient address and stamp for sending the assembly through the mail, both surfaces of said assembly being gloss-coated to facilitate detachment of the panels when they are secured in a face-to-face relationship.

4,681,254

DEVICE FOR THERMOSTATIC VALVES, PARTICULARLY FOR THE TEMPERATURE REDUCTION OF THERMOSTAT - CONTROLLED RADIATORS

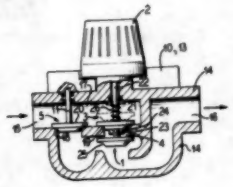
Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Grasslin Feinwerktechnik, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,630

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244603

Int. Cl.[4] F24F *11/00*

U.S. Cl. 236—42 **4 Claims**



1. A thermostatic valve system for controlling the feed of heating agent to a radiator heating means comprising a valve box through which heating agent flows to the radiator, said valve box having a principal flow path defined by a first valve seat opening and a parallel bypass flow path defined by a second valve seat opening, a thermostat control, a first thermostatic valve adjustably seated at said first opening in connection with said thermostat control, a second thermostatic valve adjustably seated at said second opening in connection with said thermostat control, a switch control means, and a further valve adjustably seated at said first opening for opening and closing said first opening in response to said switch control means, wherein said first thermostatic valve and said further valve are respectively disposed on opposed sides of said first opening and are disposed for coaxial movement relative to said first opening.

4,681,255

CABLE DRIVEN SPA THERMOSTAT CONTROLLER

Kerry P. Drost, 11 Sacramento, Irvine, Calif. 92714

Filed Jan. 21, 1986, Ser. No. 820,633

Int. Cl.[4] G05D *23/00*

U.S. Cl. 236—51 **5 Claims**

1. A temperature controlling apparatus for use in conjunction with spas, comprising

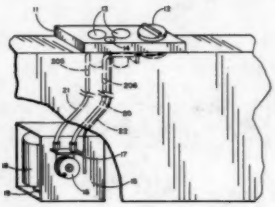
thermostat means mounted adjacent a water heating apparatus,

temperature selecting means mounted remote from said thermostat means and adjacent to a side of a spa, and

cable drive means connected between said thermostat means and said temperture selecting means such that said thermostat means is selectively driven by said temperature selecting means via said cable drive means,

said cable drive means includes at least first and second sheaves and elongated cable means extending between said first and second sheaves to provide mutual rotational motion of said sheaves,

each of said first and second sheaves includes a pair of grooves therein for receiving said elongated cable means,



said elongated cable means includes a pair of separate driving cables,

each of said separate driving cables is associated with a different one of said pair of grooves in said first and second sheaves,

said first sheave is coupled to said thermostat means,

said second sheave is coupled to said temperature selecting means, and

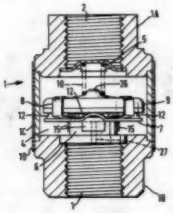
fiber optic cable means extending from said water heating means to said temperature selecting means.

4,681,256

THERMOSTATIC STEAM TRAPS

Keith Dewhirst, Stroud, England, assignor to Spirax Sarco Limited, England

Filed Apr. 24, 1986, Ser. No. 855,280
Int. Cl.[4] F16T *1/02*
U.S. Cl. 236—56 **6 Claims**



1. A thermostatic steam trap comprising:

a passageway for fluid flow;

two connections constituting opposite ends of the passageway;

a valve that opens and closes the trap having a valve seat disposed in the passageway; and

a temperature-responsive element carrying a movable part of the valve that co-operates with the valve seat to open and close the trap;

either of the connections comprising an inlet to the trap for the fluid flow with the other being an outlet from the trap for this flow, the trap thus being selectively connectable in a steam flow line either

(A) with the passageway permanently open to the steam line and the valve opening and closing the passageway downstream of the element to atmosphere to discharge condenste from the trap at a temperature close to saturated steam temperature, or

(B) with the passageway permanently open to atmosphere and the valve disposed upstream of the element to discharge condensate from the trap at a temperature significantly below steam temperature;

wherein:

the temperature-response element comprises

a housing,

a multi-diaphragm arrangement within the housing,

an interior void in said arrangement, defined by the diaphragms of the arrangement and opening from the housing through an aperature in the housing, and

volatile fluid filling the interior of the housing outside the multi-diaphragm arrangement, said movable part of said valve being carried by a movable one of the diaphragms, being disposed in the interior void, and projecting through said aperture to seat on fixed part of said valve seat to close the valve;

and wherein:

the temperature-responsive element further comprises

a spring arrangement that embraces the outside of the housing,

acts between the housing and said movable part of the valve,

opposes movement of said movable part of the valve out of the housing, and

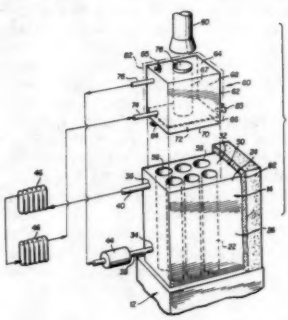
biases the valve into open condition.

4,681,257

HOT-WATER-FURNACE SUPPLEMENTAL HEATER

Reginald R. Turner, 1400 Kilmer Ln., Norfolk, Va. 23502

Filed Aug. 12, 1986, Ser. No. 895,638
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—56 **10 Claims**



1. A hot-water-furnace, supplemental water heater to be used with a furnace of the type having essentially parallel, vertically-oriented, multiple heating tubes surrounded by water for conveying combustion materials from a firebox to an exit area adjacent said multiple heating tubes to thereby heat said water, said hot-water furnace forming a flat support wall at said exit area, said supplemental water heater comprising:

a housing having a top wall and a sidewall but an essentially open bottom, a bottom edge of said sidewall defining an opening which is sufficiently large to encompass adjacent ends of said multiple furnace heating tubes and defining a planar shape for resting on said hot-water-furnace flat support wall to support said supplemental water heater and to form a seal with said flat support wall for containing combustion materials, said top wall having a top-wall opening therein;

a false-bottom wall substantially spaced from said bottom edge of said sidewall and being sealingly attached to said

sidewall, said false-bottom wall having a false-bottom opening therein;

a supplemental heating tube extending between said false-bottom opening and said top-wall opening whose ends are respectively sealingly attached to said false-bottom wall and said top wall, whereby said housing, said false-bottom wall and said supplemental heating tube form a supplemental water heating cavity surrounding said supplemental heating tube, said supplemental heating tube having at its upper end a means for attaching a chimney thereto; and

water inlet and outlet means communicating with said supplemental water heating cavity for respectively conveying water to and from said cavity;

whereby said supplemental water heater can be placed on a housing of a hot water furnace, replacing a furnace manifold, with said bottom edge of said sidewall sealing with said furnace housing and encompassing said adjacent ends of said multiple heating tubes so as to capture combustion materials exiting in a manifold space defined by said sidwall below said false-bottom wall, said false-bottom wall and said furnace housing and thereby directing said combustion materials into said supplemental heating tube for heating water in said supplemental water heating cavity.

4,681,258

PRODUCING DIRECTED SPRAY

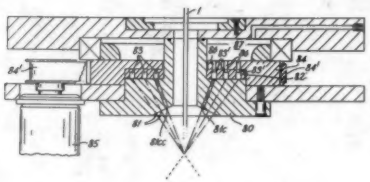
Walter N. Jenkins, and Gordon I. Davies, both of Swansea, Wales, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 603,368, Apr. 24, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 871,923

Claims priority, application United Kingdom, Apr. 25, 1983, 8311167

Int. Cl.[4] B05C *5/00*

U.S. Cl. 239—66 **5 Claims**



1. An arrangement for evenly coating a surface with a spray, comprising means for forming an unsupported supply path of liquid, a gas supply, a plurality of atomizing gas nozzles each disposed at a different location and all directed at the same point, being a point in the supply path along which the liquid will flow, control means between the gas supply and said nozzles for imparting a varying direction to the spray, the control means repetitiously varying the flow of gas through the nozzles in a predetermined sequence of at least three flow patterns said patterns being associated with an arrangement of said nozzles, said arrangement comprising respectively at least one pair of said nozzles for each said pattern, each nozzle of a pair being disposed in mirror image to the other nozzle of the pair about a fixed vertical mirror plane including the supply path, the said control means comprising, facing said gas supply, a continuously driven rotating disc, and, in sliding contact with said rotating disc, a static aperture timer disc, said rotating disc having windows which register in sequence with respective apertures in said timer disc, said apertures feeding respective said nozzles.

4,681,259

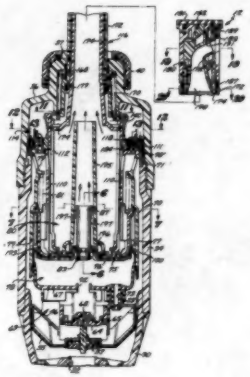
ROTARY DRIVE SPRINKLER

Edward M. Troup, deceased, late of Mt. Baldy (by Cathryn H. Troup, legal representative); Giles A. Kendall, Azusa; Joseph U. Han, Glendora; Christopher M. Moralez, Temple City, and Calvin A. Gongwer, Glendora, all of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.

Filed Dec. 19, 1985, Ser. No. 811,931

Int. Cl.[4] B05B *3/04*

U.S. Cl. 239—206 **71 Claims**



1. A rotary drive sprinkler comprising:

a sprinkler housing having a lower water inlet for inflow of water from a water supply at line pressure into said housing;

a pressure reduction assembly including means for dividing water inflow into said housing into a first flow portion substantially at line pressure and a second flow portion, and a reduction valve for reducing the pressure of said second flow portion to a predetermined reference pressure;

a piston drive assembly including a reciprocal drive piston and a piston spring for urging said drive piston in one direction, said piston drive assembly further including means for applying said first and second flow portions to opposite sides of said drive piston thereby subjecting said drive piston to a pressure differential to displace said drive piston in a second direction against said piston spring, and relief valve means for relieving the pressure differential across said drive piston at the end of a predetermined stroke in said second direction to permit said piston spring to return said drive piston through said stroke in said one direction;

a drive element rotatably supported within said housing;

motion conversion means coupled between said drive piston and said drive element for rotatably oscillating said drive element in response to reciprocation of said drive piston;

a driven element rotatably supported within said drive element;

a reversible one-way clutch assembly coupled between said drive and driven elements for rotatably driving said driven element in a selected direction in small rotational steps in response to oscillatory rotation of said drive element;

a pop-up stem assembly supported within said housing for movement between a normal retracted position substantially within said housing to an elevated spraying position with an upper end thereof elevated above said housing upon supply of water into said housing through said inlet, said stem assembly being rotatably driven by said driven element; and

a spray head on said stem assembly and including a spray

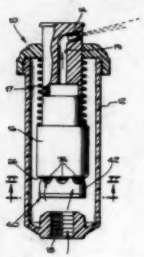
nozzle for outward projection of an irrigation water stream from said housing.

4,681,260

TWO PIECE VARIABLE STATOR FOR SPRINKLER NOZZLE FLOW CONTROL

Wilson V. Cochran, Riverside, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Feb. 11, 1986, Ser. No. 828,728
Int. Cl.[4] B05B *3/04, 15/10, 1/34;* **F16K** *15/14*
U.S. Cl. 239—240 **8 Claims**



8. In a sprinkler having a head mounting a nozzle for dispersing fluid through said head and out of said nozzle and impeller means associated with said head operatively engaging said nozzle for rotating said nozzle in response to said fluid passing through said head, the improvement comprising:

means for controlling the velocity of fluid flowing to the impeller means including

a housing for mounting within the path of fluid flow toward said head, said housing including

a base portion having at least one aperture therein for passing therethrough at least a portion of the fluid flowing toward said head to the impeller means;

a sidewall portion having at least one aperture therein for selectively passing fluid there through to bypass the impeller means; and

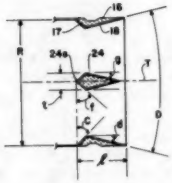
flexible barrier means overlying said at least one sidewall aperture for selectively opening said sidewall aperture in response to an increase in fluid pressure about said second aperture.

4,681,261

HEAT RESISTANT SHORT NOZZLE

Dallas G. Wetzler, and Ralph R. Conley, both of Florissant, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 1, 1985, Ser. No. 782,629
Int. Cl.[4] B63H *11/10, 11/00;* **D01H** *9/10*
U.S. Cl. 239—265.19 **5 Claims**



1. An exhaust nozzle for an engine which generates thrust by expulsion of gaseous products of fuel combustion, comprising:

(a) a substantially annular wall structure defining an inlet and an outlet and a compression region near said inlet and an expansion region near said outlet for passage of said gaseous products along a central thrust axis defined through said nozzle from said inlet to said outlet;

(b) said annular wall structure having a contoured annular inner surface between an inlet plane defined at said inlet and an outlet plane defined at said outlet, said surface defining within said compression region near said inlet plane a first radially inwardly convergent annular ramp of first preselected length and first preselected angle of convergence relative to said axis, and within said expansion region near said outlet plane a second radially outwardly divergent annular ramp of second preselected length and second preselected angle of divergence relative to said axis, said first preselected length and angle differing respectively from said second preselected length and angle, said first and second ramps joining along said contour between said inlet plane and said outlet plane to define a nozzle throat of preselected inside diameter separating said compression region from said expansion region;

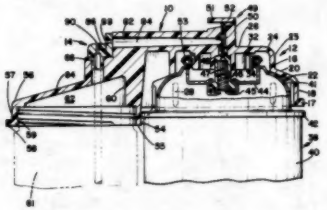
(c) a transverse web member disposed at said nozzle throat and extending diametrically of said annular wall structure and defining two substantially symmetrical passageways extending through said nozzle between said inlet and outlet planes, said web member having a leading edge intersecting said axis and lying substantially in and diametrically of said inlet plane and a trailing edge intersecting said axis and lying substantially in and diametrically of said outlet plane, said web member further having a double wedge shaped cross section symmetric with respect to a plane containing said axis and having maximum thickness at said nozzle throat, the surface of said web member defining a first pair of radially divergent ramps along said leading edge and extending from said inlet plane to said nozzle throat and a second pair of radially convergent ramps along said trailing edge and extending from said nozzle throat to said outlet plane.

4,681,262

CAP CONNECTING PROPELLANT CONTAINER WITH MATERIAL CONTAINER

Fritz A. Sprute, Chagrin Falls, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sep. 27, 1985, Ser. No. 781,067
Int. Cl.[4] B05B *7/30*
U.S. Cl. 239—306 **13 Claims**



1. A spray device comprising an aerosol container adapted to hold the pressurized propellant, the aerosol container having a body and a dome at one end of the body and a receiving means on the dome;

the receiving means including an annular inwardly projecting annular lip and a recess therebelow, an opening in the dome whereby fluid may pass from the aerosol container and a spring-biased valve in the dome of the aerosol container;

a spray head adapted for use with the aerosol container including a first cap adapted to interfit with a portion of the dome including means for gripping the receiving means, the means for gripping including generally arcuately shaped resilient sections dimensioned so that they

cam against and engage the annular lip of the receiving means when the cap is placed on the aerosol container; and

a second cap including a bridge portion operatively connected to the first cap, the bridge including a channel therein connecting the opening in the first cap with a bore in the second cap whereby the means for gripping on the first cap interacts with the second cap to place a portion there between in compression or tension when a force is exerted on the spray head which attempts to rotate it relative to the longitudinal axis of the container, the resistance of the cap to the compression or tension causing it to hold it against substantial forces from being misaligned or removed from the aerosol container.

4,681,263

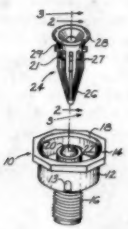
LOW PROFILE SPRINKLER HEAD

Haggie I. Cockman, P.O. Box 1600, Sanford, Fla. 32771

Filed Jul. 29, 1985, Ser. No. 759,697

Int. Cl.[4] A62C *31/02*; B05B *1/26*

U.S. Cl. 239—391 **7 Claims**



1. A low profile sprinkler head comprising:

a body portion having a circular cup-like base portion;

a male, externally threaded coupling member extending downward from said base portion for coupling to a water supply, said coupling member having an axial bore therethrough; and

an interchangeable nozzle head having an upper deflector portion, a straight cylindrical portion and a tapered concial portion extending downward from said upper portion for insertion into said axial bore, said straight cylindrical portion of said nozzle head thereby forming a tight friction fit in said bore, said straight and tapered portions having a plurality of water flow passages in at least a portion of the circumferences thereof.

4,681,264

ENHANCING LIQUID JET EROSION

Virgil E. Johnson, Jr., Gaithersburg, Md., assignor to Hydronautics, Incorporated, Laurel, Md.

Division of Ser. No. 324,251, Nov. 25, 1981, Pat. No. 4,474,251, which is a continuation-in-part of Ser. No. 287,870, Jul. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 215,829, Dec. 12, 1980, Pat. No. 4,389,071. This application Jul. 27, 1984, Ser. No. 635,190

Int. Cl.[4] B05B *1/08*

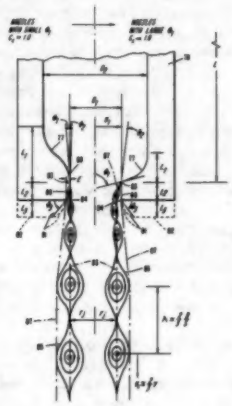
U.S. Cl. 239—589.1 **20 Claims**

1. Apparatus for producing a pulsed liquid jet exiting through an exit nozzle for eroding a solid surface, comprising:

(a) means for forming a high velocity liquid jet;

(b) acoustic-hydrodynamic oscillator means for oscillating the velocity of the jet at a Strouhal number within the range of from about 0.2 to about 1.2; and

(c) means for amplifying the jet velocity oscilations, said means for amplifying said oscillations including said exit nozzle, wherein the internal contour of said exit nozzle is



adapted to provide feedback of the velocity oscillations in the jet to said oscillator means.

4,681,265

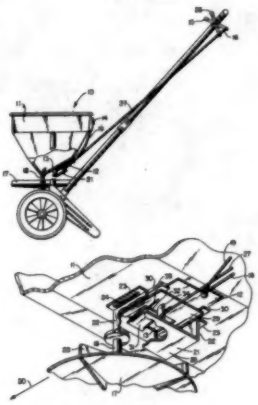
SWATH-CONTROLLING VARIABLE CHUTE AND CHUTE-ACTIVATED DAMPER FOR A BROADCAST SPREADER

James D. Brabb, London, and Dennis L. Simpson, Marysville, both of Ohio, assignors to White Castle System, Inc., Columbus, Ohio

Filed Oct. 18, 1985, Ser. No. 788,874

Int. Cl.[4] A01C *17/00*

U.S. Cl. 239—665 **1 Claim**



1. In a broadcast spreader for distributing granular or pelletized material and including a hopper having a discharge port, a shutter disposed below the discharge port and movable between a closed position and a plurality of open positions relative to said discharge port, shutter control means for selectively shifting the shutter between said closed and open positions, and a rotary impeller spaced below said shutter for receiving material passing from the hopper through the discharge port and for casting said material outwardly from the

spreader in a generally fan-shaped distribution pattern, that improvement which comprises:

(a) a nonrotating material-directing chute slidably and externally disposed relative to the hopper for linear movement between a plurality of chute positions ranging from relatively greatest to least interposition between the discharge port and the impeller, said chute being variably disposed between the discharge port and the impeller so as to direct material onto a variable area of the impeller, at least one of said chute positions causing said impeller to distribute the material in a first distribution pattern and another of said chute positions causing a second distribution pattern;

(b) chute control means for selectively shifting said chute between said chute positions during operation of said spreader and independently of the shutter control means;

(c) a material-receiving drop area on the rotary impeller, said drop area having a generally fixed radially inner boundary and a varibale radially outer boundary whose position on said rotary impeller is determined by said chute position;

(d) a damper disposed between the shutter and said chute and provided with a valve plate that is movable between relatively closed and opened conditions, said valve plate providing in the relatively closed condition a greater obstruction to the flow of material from the discharge port to the chute than in the relatively opened condition; and

(e) means provided on the chute for engaging the valve plate and urging it into the relatively closed condition as said chute reaches the position of greatest interposition between the discharge port and the impeller.

4,681,266

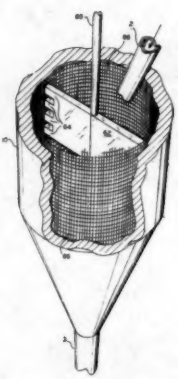
METHOD OF PARTICULATING AGGLOMERATED CATALYST MATERIALS

Ronald G. Mason; Emory W. Pitzer; Max P. McDaniel, all of Bartlesville, Okla.; David L. Rogers, Houston, Tex., and James W. Waterman, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1986, Ser. No. 820,344

Int. Cl.[4] B02C *19/12, 23/24*

U.S. Cl. 241—18 **23 Claims**



1. A method for producing particles having a controlled particle size, from agglomerated catalyst material which comprises:

(a) introducing said agglomerated catalyst material into a beater mill comprising:

a cylindrical housing,

a cylindrical screen having an inner and outer surface positioned within said housing concentric thereto,

a shaft having an axis of rotation aligned colinearly with the axis of said cylindrical housing, and positioned in the center of said housing,

at least one rotor having a plurality of blades thereon rotatably mounted on said shaft, wherein said blades extend outwardly into close proximity with the inner surface of the cylindrical screen,

inlet means for introducing air into said beater mill, and

inlet means for introducing said agglomerated catalyst material into said beater mill;

(b) breaking said agglomerated catalyst material into smaller size particles by rotating said shaft and said plurality of blades; while

(c) concurrently passing a sufficient volume of air through said beater mill to remove sufficient volatile material from said agglomerated catalyst material to render said agglomerated catalyst material non-sticky as said agglomerated catalyst material passes through said cylindrical screen; and thereafter

(d) recovering said particles having a controlled particle size distribution.

4,681,267

METHOD OF REGENERATING OLD CASTING SAND

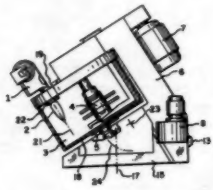
Dieter S. Leidel, R.R. No. 5, Barrier, Ontario L4M 4S7, Canada; Hubert Eirich, Sandweg 16, 6969 Hardheim, Fed. Rep. of Germany; Paul Eirich, Bahnhofstrabe 11, 6969 Hardheim, Fed. Rep. of Germany, and Walter Eirich, Spessartweg 18, 6969 Hardheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 497,482, May 23, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 720,129

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309379

Int. Cl.[4] B02C *19/18*

U.S. Cl. 241—23 **1 Claim**



1. A method of regenerating old casting sand comprised essentially of sand grains encased within a clay binder subject to thermal embrittlement, comprising the steps of:

providing a container having a cylindrical side wall and a bottom wall supported for rotation about a first axis that is inclined relative to a vertically extending plane, the container having upper and lower regions with each region having the bottom wall as one of its boundaries, a nonrotatable cover for closing said container, and an L-shaped stripping member secured to said cover to extend within the container adjacent said cylindrical side wall into said upper region and then along said bottom wall towards said lower region;

positioning a crushing tool within said container for rotation about a second axis of rotation arranged parallel to the first axis, with the crushing tool being positioned intermediate said upper and lower regions;

introducing old casting sand into said container;

rotating said container about said first axis and rotatins said crushing tool about said second axis thereby generating substantial turbulence of said old casting sand within said container;

directing a hot gas into said lower region along a further axis that is disposed parallel to said first and second axes, passing the turbulent old casting sand through said hot gas, thereby heating said binder of said turbulent old casting sand passing therethrough to a temperature at

which thermal embrittlement thereof occurs, thereby embrittling said binder, and then immediately impinging said old casting sand on said crushing tool, thereby separating portions of said binder embrittled by passage through said hot gas from said sand grains prior to the heating of said sand grains to said temperature;

removing the separated portions of said embrittled binder from said container by a vacuum applied adjacent said crushing tool.

4,681,268

AUTOGENOUS GRINDING METHOD

Olle E. Marklund, Boliden; Carl-Gustaf Elmlid, Skelleftea; Ulf P. Marklund, Vilhelmina, and Michael C. Borell, Skelleftea, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

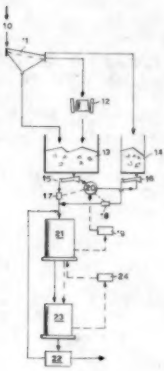
PCT No. PCT/SE82/00392, § 3/1 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01914, PCT Pub. Date Jun. 9, 1983

Continuation of Ser. No. 755,228, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 525,044, Jul. 5, 1983, abandoned. This PCT application Nov. 22, 1982, Ser. No. 843,793

Claims priority, application Sweden, Nov. 27, 1981, 8107096

Int. Cl.[4] B02C *23/08*

U.S. Cl. 241—24 **6 Claims**



1. In a process for comminuting ore containing a mixture of coarse particulate material together with the fine fractions which occur naturally upon crushing wherein the ore is comminuted in a primary grinding mill to form an intermediate product, and said intermediate product is further comminuted in a secondary grinding mill, and wherein said coarse particulate material is comminuted in said primary mill by autogenous grinding, the improvment comprising:

(A) fractionating said coarse particulate ore prior to comminution in the primary grinding mill into three fractions to recover a coarse particle size fraction, an intermediate particle size fraction and a fine particle size fraction wherein

(i) said fine particle size fraction consists essentially of the portion of said coarse particulate material having a particle size not greater than the intersection of two tangents to the particle size distribution curve obtained by autogenous grinding of said coarse particulate material without fractionation, which particle size distribution curve is characterized by a first segment which is a downwardly sloping portion representing relatively coarser material and a second segment which is a nearly horizontal portion extending generally between the maximum particle size which will be broken up by impact and the particle size which results from said impact, there being in each of said segments a point of inflection, and said tangents are tangent to the particle size distribution curve at the points of inflection in said first and second segments of said curve,

(ii) said coarse fraction consists essentially of the particles in said coarse particulate material of which the weight of the smallest particle in the coarse fraction is at least 20 times the weight of the heaviest particles in said fine fraction, and

(iii) said intermediate particle size fraction consists essentially of the coarse particulate material not recovered as either fine or coarse fractions

(B) comminuting the intermediate size fraction recovered from said fractionation step so that the coarsest particle size of the comminuted intermediate fraction is not greater than the coarsest particle of the fine particle size fraction; and

(C) combining said comminuted intermediate fraction, said fine particle size fraction and said coarse particle size fraction as a feed to the primary autogenous grinding mill.

4,681,269

CONSTRUCTION OF BEARING FOR CONE CRUSHER

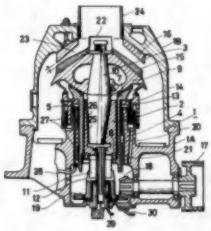
Kazuaki Arakawa, Osaka, Japan, assignor to Kurimoto Ltd., Japan

Continuation of Ser. No. 721,624, Apr. 10, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 924,184

Claims priority, application Japan, Dec. 28, 1984, 59-279645

Int. Cl.[4] B02C *2/04*

U.S. Cl. 241—101.2 **8 Claims**



1. A cone crusher comprising a frame defining a sleeve having an upper end an eccentric situated for rotation within the frame, and a lower end, a cylindrical socket situated for reciprocal movement within the sleeve, said eccentric extending into and being supported by the socket, a crushing head situated to gyrate relative to the eccentric, means for producing hydraulic pressure for reciprocating the eccentric and crushing head, and bearing construction including bearing means situated at the upper end of said socket for supporting the crushing head, and further bearing means situated at the lower end of said socket for supporting the eccentric.

4,681,270

MANUFACTURED REFINING ELEMENT

David P. Oberhofer, Bayside, Wis., assignor to Sullivan Corporation, Waukesha, Wis.

Filed Nov. 8, 1985, Ser. No. 796,231

Int. Cl.[4] B02C *7/12*

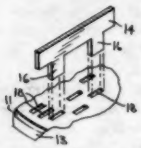
U.S. Cl. 241—298 **9 Claims**

1. A manufactured refining element comprising:

a base having formed therein a plurality of slots,

a plurality of refining bars, each bar having at least one tongue wherein the tongue of each refining bar is received in one of the slots in mating engagement and extends from a topside of the base, through the base, to an underside of

the base and the slots are arranged to hold the refining bars in a predetermined pattern; and



securing means connected to each tongue or the underside of the base for holding.

4,681,271

YARN END FINDING APPARATUS

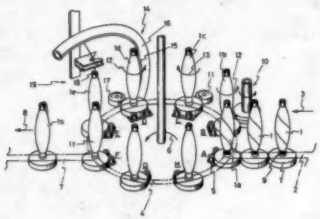
Isamu Matsui, Kyoto; Hiroshi Uchida, Oumihachiman; Hiroo Otoshima, Shiga; Yasuhiko Kubota, and Tetsuji Masai, both of Nagaokakyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 23, 1986, Ser. No. 821,698

Claims priority, application Japan, Jan. 23, 1985, 60-10565

Int. Cl.[4] B65H *54/00*

U.S. Cl. 242—18 R **17 Claims**



1. An apparatus for finding an end of a yarn on a spinning bobbin fitted uprightly on a tray, comprising:

a cutter mechanism for releasing and cutting a yarn end on the bobbin,

a yarn end pick-up mechanism located adjacent said cutter mechanism for picking up an end of the cut yarn from a layer of the yarn,

a yarn end inserting mechanism located adjacent said yarn end pick-up mechanism for cutting the yarn end picked up from the yarn layer to a particular length and for inserting the yarn into a center hole of the bobbin, and

delivery means for delivering said spinning bobbin fitted uprightly on said tray in sequence to each of said cutter mechanism, said yarn end pick-up mechanism and said yarn end inserting mechanism, whereby the end of the yarn is found while the bobbin is held integrally on a tray.

4,681,272

ARRANGEMENT FOR POSITIVE SUPPLY OF ELASTOMER FILAMENTS IN TEXTILE MACHINES

Heinz Brunner, Albstadt, and Stefan Seeger, Jungingen, both of Fed. Rep. of Germany, assignors to SIPRA Patententwicklungs-und Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany

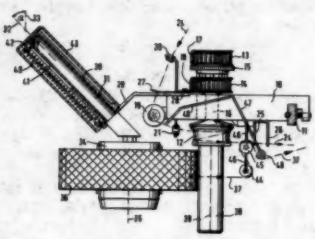
Filed Apr. 16, 1986, Ser. No. 853,337

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515104

Int. Cl.[4] B65H *49/18, 49/20, 49/34, 51/20*

U.S. Cl. 242—47.01 **11 Claims**

1. An arrangement for positively supplying elastomer fibers in a textile machine, comprising drive means; a yarn spool for an elastomeric filament; a freely rotatable spool holder for said yarn spool; a drive roller arranged so that said yarn spool abuts against said drive roller over a predetermined abutment length said drive roller drivable by said drive means and having a length which is greater than said predetermined abutment length, said drive roller having an axis extending in a predetermined plane; and a support which supports said spool holder and is longitudinally displaceable along a line such that said line or its projection extends in said plane of said axis of said drive roller and at an acute angle relative to said axis of said drive roller.



4,681,273

APPARATUS FOR DRIVING TAPES

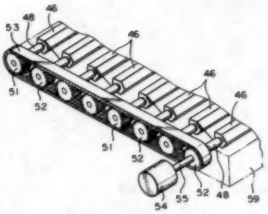
Toshinobu Futagawa, 3-3-23, Nishishinjuku, Shinjuku-ku, Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,310

Claims priority, application Japan, Feb. 16, 1984, 59-27842; Feb. 16, 1984, 59-27844

Int. Cl.[4] G11B *3/30, 23/12*

U.S. Cl. 242—55 **4 Claims**



1. Apparatus for driving tape of the kind for recording information thereon, comprising

(i) a first roller mounted to rotate about a first axis, the first roller having a plurality of flat faces forming a regular equilateral polygon on which the tape is wound,

(ii) a second roller mounted to rotate about a second axis parallel to the first axis, the second roller having a plurality of flat faces forming a regular equilateral polygon that is congruent with the polygon of the first roller,

(iii) an information recording tape extending between the first and second rollers without any intervening tape guide means, the tape having one end wound on the first roller with one face of the tape on the inside and the tape having its other end wound on the second roller with the opposite face of the tape on the inside, and

(iv) drive means for causing the rollers to simultaneously rotate in opposite directions whereby upon rotation of the first and second rollers, corresponding flat faces of the polygons of those rollers are brought simultaneously into a plane that is parallel to the plane connecting the axes of the first and second rollers.

4,681,274

METHOD AND DEVICE FOR ATTACHING A WEB OF MATERIAL ROLLING TO THE BEGINNING OF A WOUND FRESH WEB

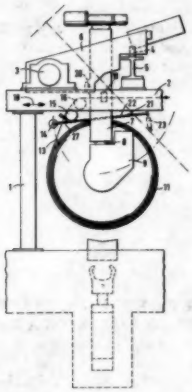
Karl Thievessen, Grevenbroich, and Peter Weiss, Neuss, both of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,522

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440107; Apr. 23, 1985, 8511986[U]

Int. Cl.[4] B65H *19/18, 19/12*

U.S. Cl. 242—58.3 9 Claims



1. A device for attaching the end of an off-running first web to the beginning of another web, comprising: means for mounting a first reel having a first web for unwinding and for mounting a replacement reel with a second web upon removal of the first reel; means receptive of the first web for forming a web path during unwinding wherein the web path forming means includes means for extending the length of the web path when not unwinding to reserve a portion of the first web; means for cutting the first web upstream of the reserved portion when not unwinding; and transfer means for moving the reserved portion of the first web into contact with the outer surface of the second web on the replacement reel while the replacement reel is stationary with no relative longitudinal movement between the first and second webs.

4,681,275

TRAVERSING MECHANISM CONTROL

Art Honczarenko, Wayne, N.J., assignor to Progressive Machine Co., Inc., Patterson, N.J.

Filed Oct. 22, 1985, Ser. No. 790,068

Int. Cl.[4] B65H *54/10, 54/32*

U.S. Cl. 242—67.1 R 10 Claims

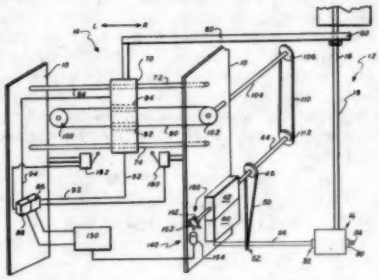
1. A control for a traversing mechanism, including a traversing carriage, that is moved in a reciprocatory manner and includes clutch means selectively operated to clutch the traversing carriage to either a first portion of a drive member to be moved in a first direction thereby or to a second portion of the drive member to be moved in a second direction thereby, the traversing carriage in its reciprocatory movements serving to guide a ribbon of material in reciprocatory traverse movement as the material is being wound into a package configuration by a continuously rotating spindle, comprising:

(a) sensor means responsive to the rotation of the spindle to provide indications of incremental rotation thereof;

(b) two stage counter means cooperating with said sensor means to receive said indications of incremental rotation of the spindle therefrom and coacting with the traversing carriage clutch means to activate and deactivate same;

(c) said two stage counter means cooperating with the clutch means following receipt by said counter means from said sensor means of a first predetermined count to de-clutch the clutch means so that the traversing carriage is not clutched to its drive members, and there is a dwell of predetermined rotational duration;

(d) said two stage counter means cooperating with the clutch means following receipt by said counter means



from said sensor means of a second predetermined count to actuate the clutch means to clutch the traversing carriage to its drive member for movement thereby in either said first or said second direction thereof;

(e) said two stage counter and said sensor means so cooperating to successively provide said dwells and to clutch said traversing carriage to its drive member for alternating movement in said first and said second directions.

4,681,276

FISHING REEL

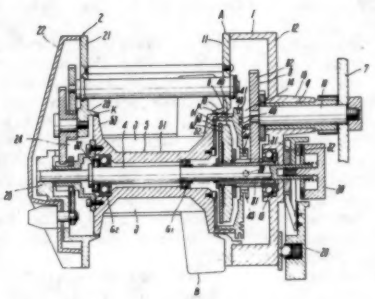
Jun Sato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 25, 1985, Ser. No. 715,393

Claims priority, application Japan, Mar. 28, 1984, 59-45739[U]; Oct. 31, 1984, 59-165943[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.1 R 4 Claims



1. A fishing reel, comprising:

a spool having a pair of flanges,

a reel body having an annular inner surface opposite an outer periphery of one said flange and forming a chamber in continuation of said annular inner surface, said spool being rotatably supported to said reel body,

a drag mechanism disposed in said chamber and having a drag disc opposite to the one said flange of said spool,

a cylindrical member having an extension (i) extending axially outwardly from the outer periphery of the one said flange of said spool, (ii) enclosing a periphery of said drag

mechanism, and (iii) having an opening at an utmost end of said extension,

a cover for covering said opening at the utmost end of said extension of said cylindrical member,

a guide means for guiding water toward a bottom of said reel body, which water enters into said chamber through a gap between the outer periphery of the one said flange and the annular inner surface of said reel body, said guide means comprising at least one annular projection (i) disposed axially adjacent said utmost end of said extension of said cylindrical member, (ii) disposed on a radial outer side of said cover, and (iii) projecting radially outwardly with respect to the outer periphery of said cylindrical member, and

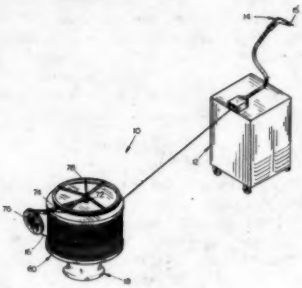
a drain located at the bottom of said reel body for draining to a region exterior to said reel body water entering into said chamber.

4,681,277

WELDING WIRE DISPENSER

Delmar D. Kosch, Columbus, Nebr., assignor to Weldmatic Patents, Inc., Columbus, Nebr.

Filed Dec. 29, 1986, Ser. No. 947,422
Int. Cl.[4] B65H *49/18, 57/18, 59/04*
U.S. Cl. 242—156.2 **6 Claims**



1. A welding wire dispenser for dispensing wire to a wire feeder,

a support means having a first brake portion thereon,

a vertically disposed shaft means rotatably mounted on said support means and extending upwardly therefrom,

said shaft means being vertically movable between first and second positions with respect to said support means,

means mounting said shaft means on said support means whereby rotation of said shaft means in one direction will cause said shaft means to vertically move upwardly relative to said support means and whereby rotation of said shaft means in an opposite direction to said one direction will cause said shaft means to move downwardly relative to said support means,

a coil support means rotatably mounted on said shaft means above said support means and vertically movable with said shaft means,

said coil support means having a second brake portion thereon adapted to frictionally engage said first brake portion to limit the rotation of said coil support means when said brake portions are in frictional engagement with each other when said shaft means is in its said first position, said coil support means adapted to support a coil of welding wire thereon,

a brake arm operatively secured to the upper end of said shaft and extending laterally relative to said coil support means,

a first pulley rotatably mounted on the outer end of said brake arm adapted to have the welding wire on the coil extending therearound,

an accumulator pulley freely operatively rotatably mounted on said shaft means above the coil and adapted to receive the welding wire thereon after the welding wire has passed around said first pulley,

said brake arm adapted to rotate said shaft when the welding wire is pulled towards the wire feeder,

said shaft vertically moving upwardly from its said first position towards its said second position so that said brake portions will not be in frictional engagement with each other so that said coil support means may freely rotate when the welding wire is pulled toward the wire feeder,

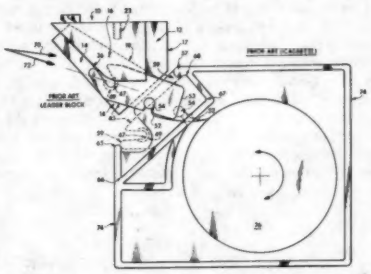
said accumulator pulley permitting wire to be pulled therefrom towards said wire feeder prior to the disengagement of said brake portions.

4,681,278

GUIDE FOR RESTORING AND REMOVING A TAPE LEADER BLOCK TO AND FROM A TAPE CASSETTE

David E. Smith, Lafayette, Colo., assignor to Aspen Peripherals, Longmont, Colo.

Continuation-in-part of Ser. No. 872,951, Jun. 11, 1986. This application Aug. 14, 1986, Ser. No. 896,673
Int. Cl.[4] G03B *1/04;* G11B *15/32, 23/107*
U.S. Cl. 242—195 **3 Claims**



1. A tripartite wedge guide for aiding the restoration of a leader block into a leader block housing in a tape cassette, said guide comprising:

a first wedge having its wedging surface in a substantially vertical plane which rises as it approaches the leader block housing of the cassette;

a second wedge attached to a lower region of, and substantially perpendicular to, the vertical plane of the first wedge such that the second wedge rises at it approaches the leader block housing; and

a third wedge attached to an upper region of, and substantially perpendicular to, the vertical plane of the first wedge such that the third wedge descends as it approaches the leader block housing and thereby partially defines a window region between said first, second and third wedges through which the leader block passes in order to at least partially restore the leader block to a substantially horizontal orientation and to aim the leader block into the interior of the leader block housing.

4,681,279

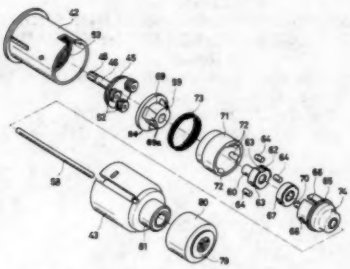
SCREEN ROLL MEANS

Daijiro Nakamura, Ono, Japan, assignor to SM Industrial Co., Ltd, Osaka, Japan

Continuation of Ser. No. 740,212, Jun. 3, 1985, abandoned. This application May 12, 1986, Ser. No. 862,202

Int. Cl.[4] B65H 75/48; E06B 9/20

U.S. Cl. 242—107.3 1 Claim



1. A roll up screen device, comprising

a circular cylindrical hollow shaft (13);

a screen (12) which is wound up on the outer periphery of said shaft (13) to a desired length and locked thereat in one condition and rolled out to a desired length and locked thereat in another condition;

spring means (21) disposed in the hollow of said shaft (13) toward one end thereof and wound up by said screen being rolled out to provide resilient force for winding up said screen on said shaft; and

contained within hollow of said shaft (13) toward another end thereof, in combination,

a gear case (42) tightly fit within said shaft (13) and having gear teeth (53) within the inner peripheral surface thereof;

a housing (43) connected to said gear case (42) and integrally movable therewith;

a gear carrier (45) comprising a shaft (48) for attachment to an external fixture (51) and three planetary gear shafts (55);

three planetary gears (52) rotatably held on said planetary gear shafts (55) and aligned with the gear teeth within said gear case (42), a solar gear (54) disposed aligned within and between said three planetary gears (52) and connected to a cylindrical portion (59), said cylindrical portion (59) comprising a circular cylinder of selected radius and three fins (69*a*) of larger radius extending radially outwardly from said circular cylinder with three spaces (69) between the fins having the selected radius;

a first one way clutch (61) disposed within said circular cylinder of said cylindrical portion;

a magnetic cam (62) having three grooves (63) spaced equally apart around the periphery thereof;

a first shaft (60) attached to said cam (62) and disposed within said first one way clutch for one way rotation of said cam;

three magnetizable rollers (64) disposed about the outer periphery of said cam (62);

a roll holder (65) comprising a cylindrical ring with three grooves (66) therein spaced apart at the same circumferential locations as the grooves in the cam (62), said rollers (64) being held within said grooves (66) of the holder (65), three projections (70) extending from said cylindrical ring and into said three spaces (69) between said fins (69*a*) of the cylindrical portion (59) for movement in the spaces between the fins;

a feed magnet (67) connected to said roll holder and positioned adjacent said cam (62) to cause movement of said cam in a one way direction of said first one way clutch;

a second one way clutch (76) connected to said roll holder and movable therewith;

a lock ring 71 having a third one way clutch 73 thereon and disposed between said case (42) and said roll holder (65), said lock ring having on its inner peripheral surface three protrusions (72), whereby in an unlocked state said rollers (64) are in said grooves (66) of said holder (65) and in said grooves of said cam (62) and said rollers are not in contact with said protrusions (72), and in a locked state said rollers (64) are in said grooves (66) of said holder and outside of said grooves (63) of said cam (62) and in contact with said protrusions (72), and whereby said third one way clutch (73) enables one way rotation of the case (42) in a locked state and two way rotation of said case (42) in an unlocked state;

a cylindrical third magnet (81) connected to said housing (43);

a cylindrical magnetizable yoke (82) surrounding said third magnet (81) and connected to said housing (43) and movable therewith;

a cylindrical aluminum rotor (80) disposed between said third magnet (81) and said yoke (82); and

a shaft (75) connected to said rotor (80) and disposed in said second one way clutch (76) to enable said rotor (82) and shaft to move in only one direction, whereby during pulling out operation when said spring is being wound up said third one way clutch (76) prevents said rotor (80) from moving relative to said third magnet (81) and said yoke (82), and during rolling up operation driven by said spring (21) said rotor rotates by force of said spring (21) against the effects of the magnetic field between said third magnet (81) and said magnetizable yoke (82) to cause braking of movement of said holder (65) in relation to said shaft (13); and wherein movement of shaft (13) in the unwinding direction and then in the winding direction, which causes each projection (70) to travel from a left side of one fin (69*a*) to the ring side of an adjacent fin (69*a*), moves said cam (62) so that rollers (64) come outside grooves (63) to contact the protrusions (72) to lock the shaft (13) against winding rotation.

4,681,280

MAGNETIC-TAPE CASSETTE WITH STRETCHED LINER ARRANGEMENT

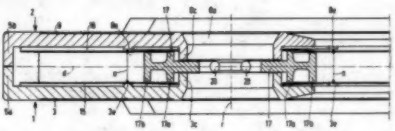
Jozef M. Duurland, Leusden; Sinnighe J. Bos, Glanerbrug, and Hendrik K. Kreeft, Dinxperlo, all of Netherlands, assignors to Polygram International Holding B.V., Baarn, Netherlands

Filed Mar. 26, 1986, Ser. No. 844,053

Claims priority, application Netherlands, Mar. 27, 1985, 8500888

Int. Cl.[4] G11B 23/087

U.S. Cl. 242—199 8 Claims



1. A magnetic tape cassette comprising:

a housing having two parallel main walls having respective inner sides facing each other, and means for interconnecting said main walls to hold them in fixed relationship with respect to each other, each main wall having two openings bounded by circular cylindrical centering rims extending inwardly relative to the respective main wall, said openings and rims in one main wall being coaxial with respective openings and rims formed in the other main wall,

two reel hub sets disposed between said main walls, each reel hub having two respective axial ends and a given outer diameter, and being arranged to be rotatable about a respective axis of rotation extending substantially perpen-

dicularly to the main walls and subdstantially coaxially with respect to a respective pair of said coaxially aligned openings,

a length of magnetic tape having a given width, wound in a number of turns around and extending between said reel hubs, and

two liner foils, each having a given thickness and being positioned against a respective inner side of a respective main wall, each said foil being arranged to bear elastically against said turns of magnetic tape and against the respective axial ends of said reel hubs,

characterized in that each reel hub comprises a respective axially extending outer ring having a given length, and a respective axially extending inner ring having an axial length greater than said given length, said rings having respective axial ends arranged such that said liner foils are positioned and bear against said respective axial ends of both said inner rings and said outer rings, and

the inner side of each main wall comprises two inwardly extending flat supporting rings, each supporting ring being concentric with a respective centering rim and having an inner diameter larger than said outer diameter of the respective reel hub; respective supporting rings on each of said main walls being opposite each other and spaced a distance, perpendicularly to said main walls, larger than the sum of said given width and said thicknesses of said two liner foils.

4,681,281

RECORDING AND/OR REPRODUCING APPARATUS

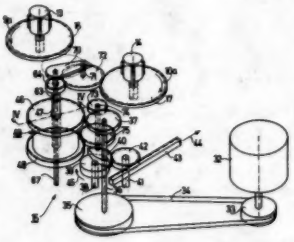
Petrus J. J. Aarts, Perchtoldsdorf, and Alois Huber, Vienna, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1986, Ser. No. 832,288

Claims priority, application Austria, Feb. 27, 1985, 581/85

Int. Cl.[4] G03B *1/04*; G11B *15/32*

U.S. Cl. 242—200 **3 Claims**



1. A record and/or reproducing apparatus for a record carrier in the form of a tape comprises

two rotatable winding spindles for driving two winding hubs which are coaxially mounted on respective spindles, said hubs taking up the tape in conformity with a direction of transport selected from two possible directions of transport,

a drive mechanism for driving the winding spindles, said mechanism comprising a first drive wheel which can be driven in one of two directions of rotation, and a second drive wheel which is rotatable relative to and coaxial with the first drive wheel,

a coupling device for rotation of the second drive wheel by the first drive wheel, said coupling device comprising first and second friction couplings to drive one of the two winding spindles depending upon the direction of transport, said first friction coupling being capable of transmitting more torque than the second friction coupling, said device further comprising an idler wheel arranged coaxially between the first and second drive wheels so as to be rotatable relative to said drive wheels, the first drive wheel being coupled to the idler wheel by the first friction coupling, the second drive wheel being coupled to the idler wheel by the second friction coupling, said device further comprising a unidirectional coupling having means for rigidly coupling the second drive wheel to the idler wheel for one of the two directions of rotation of the first drive wheel, whereby the second friction coupling is bypassed.

4,681,282

DEVICE FOR THE DETECTION AND ELIMINATION OF UNWANTED IMAGES CREATED BY THE PYRAMIDAL IR DOME

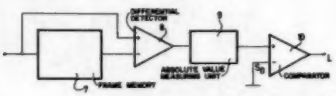
Pierre Marche, Boulogne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 28, 1985, Ser. No. 770,339

Claims priority, application France, Aug. 28, 1984, 84 13285

Int. Cl.[4] F41G *7/26*

U.S. Cl. 244—3.16 **1 Claim**



1. An electronic device for the detection and elimination of unwanted images created by a pyramidal IR dome of an infrared auto-director for a missile which is not roll-stabilized, a signal collected in the focal plane of an objective of the auto-director and originating either, in the case of a first type, in a source located in the field of the said objective and whose radiation is transmitted through the IR dome or, in the case of a second type, in a source external to the said field and whose radiation after transmission through a facet of the IR dome is reflected by an opposite facet, characterized in that, the analysis of the scene delimited by the field of the objective having as its result a succession of frames of period T, the levels of the points of the field of rank N−1 preceding any frame of rank N are stored in a frame memory, the levels of two points corresponding to the same geographical localization of the scene, one on the frame N at an instant t, the other on the frame N−1 at an instant t−T, being transmitted respectively to a non-inverting input and to an inverting input of a differential detector whose output is connected via an absolute-value measuring unit to an input of a comparator to whose other input is applied a threshold level with a positive value, the level emerging the said unit indicating the occurrence of an unwanted image if the value is greater than the said threshold value, the signal at the output of the comparator being used to inhibit the taking into consideration of the said unwanted image.

4,681,283

APPARATUS FOR CORRECTING THE FLIGHT PATH OF A MISSILE

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,332

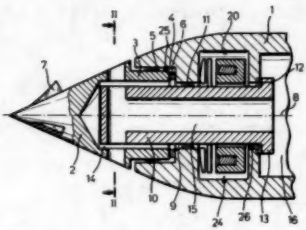
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429798

Int. Cl.[4] F42B *15/033*

U.S. Cl. 244—3.22 **15 Claims**

1. An apparatus for correcting the flight path of a missile, such as a high speed projectile, comprising a missile body having a central axis and an outer circumferential surface, a flow means distributor rotatably mounted in said missile body and having at least one outlet opening for the flow means distributor for effecting a transverse force on said missile body, at least one blow-out opening in the circumferential surface of said missile body alignable with said outlet opening, and a

braking means acting between said distributor and said missile body, wherein the improvement comprises that said missile body includes a missile part rotatable independently of said distributor and said missile part being stable with respect to



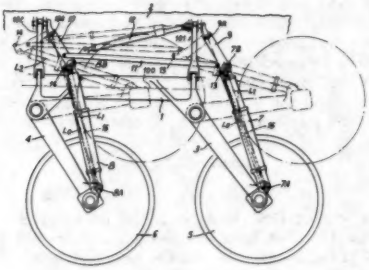
load, means for rotating said distributor, and said at least one said outlet opening and said at least one blow-out opening being at least partially alignable in a controlled manner by said means for rotating said distributor and by said braking means.

4,681,284

LANDING GEAR HAVING TANDEM WHEELS AND INDEPENDENT SHOCK ABSORBERS

Jacques Veaux, La Liberté , and Michel Derrien, Parc de Clagny, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed May 6, 1985, Ser. No. 730,790
Claims priority, application France, May 15, 1984, 84 07488
Int. Cl.[4] B64C *25/14*
U.S. Cl. 244—102 R **5 Claims**



1. A retractable landing gear having at least two wheels mounted in tandem in a single plane, for an aircraft having a fuselage, said landing gear being retractable into said fuselage in a maximum retraction condition, wherein:

said landing gear comprises a longitudinal beam solidly fixed parallel to said fuselage;

a wheel lever for each said wheel, said wheel lever having top and bottom ends which is hinged by its top end to said beam, respectively to the opposite ends of said beam; and

a rocking arm for each said wheel and having a lower end;

a respective shock absorber for each said wheel hinged at its bottom end to the bottom end of said wheel lever, the opposite end of said shock absorber being hinged to a lower end of said rocking arm which has a pivotal connection with said fuselage at a point on its upper end, both said rocking arms being connected by a parallelogram-shaped hinge constituted by a connecting rod parallel to said fuselage;

an actuator having one end hinged to said fuselage and its other end hinged to either said rocking arm or to said connecting rod; and

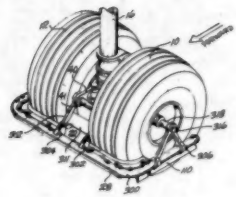
each of said rocking arms having a lateral extension near or at its lower end and a telescopic strut articuled with said extension and with said bottom end of said shock absorber to cause said shock absorber to shorten to a maximum retraction condition when said landing gear is retracted by said actuator into said fuselage.

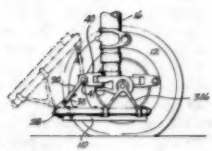
4,681,285

NOSE WHEEL WATER SPRAY DEFLECTOR ENABLING WHEEL AND TIRE CHANGES WITHOUT DEFLECTOR REMOVAL

Fredrick E. Bowdy, Seattle; Rudi K. H. Glasenapp, and Glen E. Ridgway, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 499,623, May 31, 1983, abandoned.
This application May 6, 1985, Ser. No. 730,607
Int. Cl.[4] B64C *25/00*
U.S. Cl. 244—103 R **2 Claims**





1. In combination with the landing strut and axle supporting a pair of nose gear wheels of an aircraft, a nose wheel water spray deflector having a leading edge extending forward of said nose gear wheels and beyond the outer sidewall surface portions of said pair of nose gear wheels, said nose wheeel water spray deflector having aftwardly extending side leg portions and a central surface portion extending aftwardly between said pair of nose gear wheels, said aftwardly extending side leg portions having downturned side edge portions;

said deflector mounted by a U-shaped support tube attached to the deflector upper surface along the leading edge and left and right sides, said U-shaped support tube connected by two forward support members to the tow fitting of said nose landing gear and by a left and right support member on the side legs of the U-shaped support tube to the left and right wheel axle stubs, respectively;

characterized by a mounted flexible pad being mounted onto said deflector plate bottom and extending past said deflector plate in the direction of said wheels and tires to form a most possible close but controlled gap therebetween, accommodating tire flexibility; and,

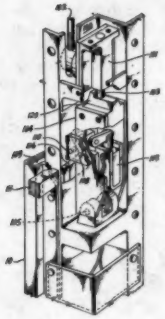
said left and right support members being connected to each axle by attachment means including the combination of a spherical bearing, a bolt through said bearing, a barrel nut, and an adapter, said two forward support members are pivotally connected to the tow fitting to provide pivoting of said deflector around the towing pin, further characterized by direct wheel/tire accessibility and wheel/tire removal after removal of only said bolts (316) and subsequently pivoting of said deflector about said tow pin, out of the way of the peripheral extent of the tires.

4,681,286

DOOR ANTI-HIJACKING LATCH/LOCK MECHANISM WITH PNEUMATIC DECOMPRESSION OVERRIDE

Royce F. Church, Lynnwood; Donald B. McCaffrey, Edmonds, and Leo W. Plude, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 444,245, Sep. 30, 1982, Pat. No. 4,522,359. This application Nov. 28, 1984, Ser. No. 677,102
Int. Cl.[4] B64C *1/14*; B64D *11/00*
U.S. Cl. 244—129.5 6 Claims



1. An aircraft door anti-hijacking latch lock mechanism having means for providing pneumatic decompression override, said device cooperating solely with a lockable conventional door latch, said latch lock mechanism having an engaged mode only in response to application of electrical power and locked with a key, said latch lock mechanism further operative in a release mode in response to either electrical switch activation on a pilot panel, loss of electrical power, key actuation from outside the control cabin of the aircraft, rotation of the conventional door latch from the control cabin, or decompression;

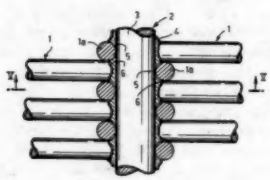
wherein said means for providing pneumatic decompression override comprises shear rivets for isolation of a spring loaded piston during retraction of said spring loaded piston, said shear rivets further operative by shearing after providing isolation, thereby enabling aircraft door opening.

4,681,287

SPIRAL WIRE AND A METHOD OF MANUFACTURING SUCH A WIRE

Axel Cedercreutz, Tampere, and Ari Salminen, Suorama, both of Finland, assignors to Tamfelt Oy AB, Tampere, Finland

Filed Sep. 6, 1985, Ser. No. 773,190
Claims priority, application Finland, Oct. 1, 1985, 850113
Int. Cl.[4] B21F *27/00*
U.S. Cl. 245—6 6 Claims



1. Spiral wire, comprising:

adjacent spirals positioned in pairs with their loops intermeshing to form transverse rows of loops; and

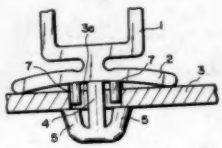
initially straight link threads of uniform cross-section passed through the rows of loops, whereby the loops of adjacent spirals are pressed against said link threads alternately from opposite sides, characterized in that in the spiral wire each link thread after said pressing comprises a straight core thread of uniform cross-section provided with a surface coating, in which grooves are formed only in said surface coating at the points of contact of the link threads and the loops.

4,681,288

FIXING COMPONENT

Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,459
Int. Cl.[4] B65D *67/02*
U.S. Cl. 248—71 4 Claims



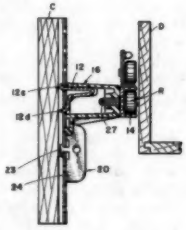
1. A fixing component comprising a holder portion having a shape suitable for holding other components, a web-like resilient seat portion connected to said holder portion and curved toward the surface of an apertured circuit board to form an arch and provided with opposite free ends for contacting said surface of said circuit board, a column portion projecting from the center of said seat portion through a hole in said circuit board, and a pair of resilient wing portions having free ends and diverging from a free end of said column portion toward the outside of said hole in said circuit board, wherein a pair of extensions are provided on said arch-shaped resilient seat portion and are biased into engagement with an inner peripheral surface of said hole by said resilient seat portion upon flexing thereof and connection of said fixing component to said circuit board.

4,681,289

SIDE MOUNTING BRACKET FOR DRAWER SLIDE

Robert L. Gronlund, Lewisburg, and John Stewart, Selinsgrove, both of Pa., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Mar. 31, 1986, Ser. No. 846,218
Int. Cl.[4] A47B *88/00*
U.S. Cl. 248—224.4 11 Claims



9. A mounting device combination for support of an article on a standard slotted pilaster strip comprising:

a polymeric fastener shell member and a V-clip support interfitting therewith;

said shell member having an outer end for attachment to an article to be supported, and an inner end;

said inner end having an opening and a receiving channel configurated to receive a V-clip support therein;

said V-clip support having a pair of legs convergent toward and joined at an apex, and having a pair of upper and lower tabs to be inserted into slots of the pilaster strip;

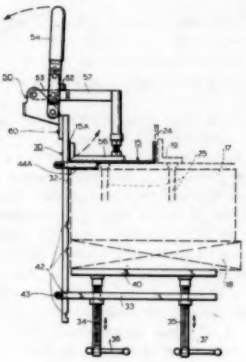
said V-clip support being enveloped within said shell member except for said tabs which protrude from said shell member inner end, whereby an article attached to said shell member outer end can be supported on the pilaster strip.

4,681,290

APPARATUS AND METHOD OF SHORING MASONRY, STONE, CONCRETE AND OTHER MATERIALS OVER OPENINGS IN BUILDINGS

Donald A. Crosbie, 11662 Luau La., Cypress, Calif. 90630

Filed Nov. 28, 1984, Ser. No. 675,885
Int. Cl.[4] E04G *21/04*
U.S. Cl. 248—225.31 **11 Claims**



1. A hanger for use during construction for supporting a masonry or ornamental lintel for window or lintel openings in a building framework having an exterior and an interior including a support lintel and columns and still defining the window or lintel opening and designed for an exterior of masonry veneer comprising:

a generally elongated body member adapted for upright hanging on a building framework from the interior thereof and extending downward from above into the window or lintel opening in the framework;

means for temporarily securing said elongated body member to the framework above said window or lintel opening;

support means for a masonry or ornamental lintel during installation comprising a first generally horizontally extending member cantilevered into the window opening

means securing said first generally horizontally extending member to said elongated body member;

a second generally horizontal member for supporting either the masonry or an ornamental lintel or a plank-like form for supporting brick or other masonry while being laid at the top of the opening; and

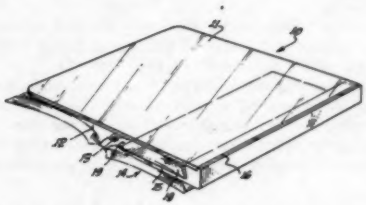
means for adjusting the spacing between said first and second generally horizontal members to provide precise positioning of the masonry or ornamental lintel.

4,681,291

BOOK HOLDER

Wilfred E. Holladay, 18536 Mescal, Rowland Heights, Calif. 91748

Filed Jun. 26, 1986, Ser. No. 879,017
Int. Cl.[4] A47B *97/04*
U.S. Cl. 248—444.1 **5 Claims**



1. A book holder affixed to a book for holding said book in an open and readable position on a surface comprising:

an open book having left and right hand open halves, a closed width and an open width equal to about twice the closed width, a height and a thickness;

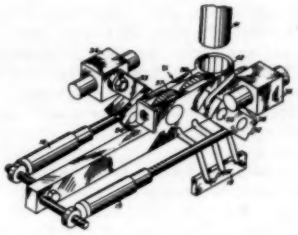
a book holder having a transparent face sheet made from a rigid and transparent sheet, said face sheet having a height about equal to the height of said book and a width about equal to the open width of the book, said book holder having a page holding sheet made from a rigid material and affixed along one edge to one edge of said transparent face sheet and extending in a parallel manner thereunder and spaced therefrom a distance of less than one-half of the thickness of the book and having a width of less than the face sheet, said transparent face sheet extending over the open pages of the book and the pages of only one of said left or right hand open halves being inserted between the transparent face sheet and the page holding sheet.

4,681,292

PNEUMATIC SEAT SUPPORT WITH LINKAGE AND HORIZONTAL SHOCK ABSORBERS

Scipio Thomas, 4444 N. Division, Davenport, Iowa 52806

Continuation of Ser. No. 691,290, Jan. 14, 1985, Pat. No. 4,632,355. This application Jun. 25, 1986, Ser. No. 880,351
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—584 **3 Claims**



1. A pneumatic support for a seat comprising:

a seat frame to which a seat is to be attached for support,

a main frame of said support to be connected to a vehicle,

guiding means connected between said seat frame and said main frame to retain said seat frame substantially horizontal while permitting in a vertical direction free reciprocal travel of said seat frame relative to said main frame,

a linkage comprising first and second levers and gear means, said gear means having first and second shafts for said first and second levers respectively, each of said first and second levers having first and second ends and an interme-

diate pivotal point, said intermediate pivotal point of each of said levers being connected to the respective one of said first and second shafts, said gear means restraining said first and second levers to rotate in unison to maintain said first ends of said first and second levers at an even height,

pivotal means for coupling said seat frame at respective spaced points to said first ends of said first and second levers,

a first pneumatic shock absorber positioned substantially horizontal and connected between said main frame and said second end of said first lever, and

an elongated spring means positioned substantially horizontal and connected between said main frame and said second end of said second lever, said first pneumatic shock absorber and said elongated spring means cooperating to provide resilient support at a desired height for said seat.

4,681,293

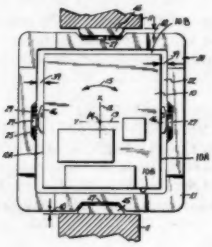
ISOLATING MOUNT FOR EXTERNAL VIBRATION SENSITIVE SENSOR

Gerald R. Cucci, Minneapolis, and Thomas P. Peterson, Minnetonka, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 761,342, Jul. 31, 1985, abandoned, which is a continuation of Ser. No. 320,211, Nov. 12, 1981, abandoned. This application Mar. 24, 1986, Ser. No. 842,758

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—603 **3 Claims**



1. In combination an isolation assembly and a sensor having X and Y axes defining a plane and a Z axis perpendicular to said plane, said sensor being sensitive to rotational movement about the Z axis, and which sensor is to be vibration isolated comprising a sensor body, a frame surrounding said sensor body, and a plurality of first isolator beam sections supporting said sensor body in at least two diametrically opposed locations, said first beam sections being attached to said frame and to said sensor body, said first beam sections being subjected to compression when the sensor is subjected to forces tending to rotate it about its Z axis, and being subjected to shear when the sensor is subjected to forces tending to move it in direction along the X, Y or Z axes, said isolator beam sections each comprising a molded assembly of a plurality of generally parallel thin shims and layers of elastomeric material substantially filling the space between said shims extending alternately along the length of the beam section, one end of each beam section being attached to the frame and the other end of each beam section being attached to the sensor, each beam section comprising a greater spacing between said shims adjacent the center portions of each beam section than adjacent the ends thereof, so the layers of elastomeric material are thicker in direction along the length of the beam section in the center portion of the beam section.

4,681,294

RESILIENT SUSPENSION FOR CONDUITS

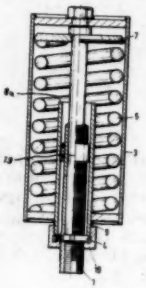
Peter Soltysiak, Berlin, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,678

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3332098

Int. Cl.⁴ F16L *3/00*

U.S. Cl. 248—613 **2 Claims**



1. A resilient suspension for tubular conduits comprising:

a tubular casing having a bottom;

a first sleeve extending into the casing as well as from the bottom out of the casing, and being mounted to said bottom;

a compression spring in said casing receiving said sleeve and bearing with one end against the said bottom;

a tension rod having a spring disk affixed thereto, the spring disk being situated in said casing, said compression spring with its other end bearing against said spring disk;

said first sleeve to the extent it extends into that casing having an axial dimension slightly larger than the axial dimension of said spring when fully compressed;

a ring-shaped stop means threaded onto the tension rod therebey abutting a portion of the first sleeve that extends from the bottom of the casing for limiting, through such abutment a displacement of the tension rod commensurate to decompression of said spring, for preventing complete decompression of the spring; and

a supplemental sleeve provided for threading onto the portion of the first sleeve that extends from the bottom of the casing, gripping around the ring for holding the ring against the first sleeve, to thereby lock the tension rod against the casing.

4,681,295

TRICURVE OPTICAL METAL MASTER MOLD AND METHOD OF MAKING

Henry Haardt, Henryville, Pa., and John Magdon, Phillipsburg, N.J., assignors to International Hydron Corporation, Woodbury, N.Y.

Continuation of Ser. No. 498,348, May 26, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,918

Int. Cl.⁴ B27D *11/00*

U.S. Cl. 249—135 **6 Claims**

1. A metal master mold for injection molding a plastic replica mold comprising the following distinct spherical zones as a molding portion:

a central spherical surface having a radius A_1 and an edge;

a first annular zone A_2 concentric with said spherical surface and having an inner edge contiguous with said spherical surface edge and outer edge; and

a second annular zone A_3 concentric with said first annular zone outer edge;

the molding portion being polished to blend the spherical zones into each other at the A_1/A_2 and A_2/A_3 junctions.

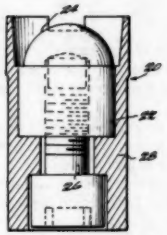
2. A process for making the optical surface of a metal master mold for injection molding a plastic replica mold for molding hydrogel contact lenses having the following distinct spherical zones;

a central spherical zone A_1 having an edge,

a first annular zone A_2 concentric with said spherical surface and having an inner edge contiguous with said spherical surface edge and an outer edge; and

a second annular zone A_3 concentric with said first annular zone having an inner edge contiguous with said first annular portion outer edge, said process comprising the successive steps of:

(1) selecting a cylindrical metal blank and determining its optical center;



(2) calculating an A_1 radius to determine the correction or power of the resulting lens, an A_2 radius to define the first annular zone and to determine the nominal center thickness of the lens, and an A_3 radius to define the second annular zone;

(3) cutting an A_1 radius in the metal blank to establish a predetermined central reference starting point;

(4) cutting an A_2 radius in the metal blank until the desired optical zone and nominal center lens thickness are obtained;

(5) cutting an A_1 radius in the metal blank to blend the A_1 radius with the A_2 radius at predetermined coordinates;

(6) cutting an A_3 radius to a predetermined diameter defining the outer circumference and tapered shape of the lens; and

(7) polishing the cut metal master to assure all three curves to blend into each other at the A_1/A_2 and A_2/A_3 junctions.

4,681,296

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

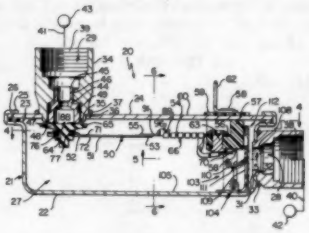
Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 794,742, Nov. 4, 1985, Pat. No. 4,651,968. This application Jun. 4, 1986, Ser. No. 870,362

Int. Cl.[4] G05D *23/19*

U.S. Cl. 251—11 **10 Claims**

1. In a valve construction comprising a housing means provided with a chamber therein and with an inlet leading to said chamber and an outlet leading from said chamber, a valve seat carried by said housing means and leading to said outlet, a movable bimetallic lever means carried by said housing means and having an operating bimetallic part and an ambient temperature compensating bimetallic part, and a valve member carried by said bimetallic lever means for opening and closing said valve seat under the control of said operating part of said bimetallic lever means, the improvement comprising deflector means carried by said housing means in said chamber thereof and having opening means therethrough that is aligned with said inlet for receiving a fluid flow from said inlet and for directing said fluid flow from said inlet away from said operating part of said bimetallic lever means and toward said ambient



temperature compensating part when fluid flows through said chamber from said inlet through said outlet.

4,681,297

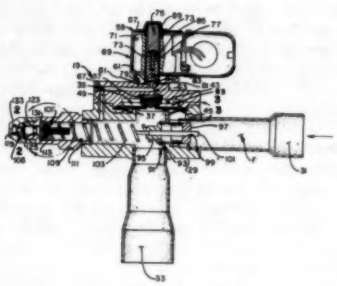
ADJUSTABLE PRESSURE REGULATING SOLENOID VALVE

Denny W. Mertz, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 1, 1985, Ser. No. 729,305

Int. Cl.[4] F16K *31/12*

U.S. Cl. 251—45 **10 Claims**



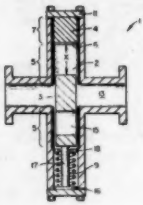
1. A pressure regulating valve comprising a valve body having a flow path therethrough, the latter having an inlet and an outlet, said valve body having a main valve seat within said flow path and a main valve member mounted within said valve body for movement between an open position in which said main valve member is clear of said main valve seat for the primary flow of fluid between said inlet and said outlet and a closed position in which said main valve member engages said main valve seat so as to block the primary flow of said fluid, and means for permitting a secondary flow of fluid from said inlet to said outlet when said main valve member is in its closed position and when the pressure differential between said inlet and said outlet exceeds a predetermined value said flow and pressure differential means comprising a secondary valve seat in communication with said flow path upstream and downstream from said main valve seat, and a secondary valve member movable between a closed position in which it sealingly engages said secondary valve seat thereby to block the flow of fluid between said inlet and said outlet via said secondary valve seat, and an open position in which said secondary valve member is clear of said secondary valve seat thereby to permit said secondary flow of said fluid between said inlet and said outlet via said secondary valve seat.

4,681,298

SLIDABLE ELECTRIC VALVE DEVICE HAVING A SPRING

James A. Bodine, Walnut Creek; Judson S. Kuehn, San Rafael, and William H. Silcox, San Francisco, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 14, 1986, Ser. No. 863,205
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.1 **2 Claims**



1. An electric valve for use in remote locations, such as the sea floor, in which a large volume of high pressure, high temperature, caustic flow is encountered, comprising:

a valve body that is capable of withstanding high pressure which has a cylindrical passage that is closed at both ends, and a pair of in-line, cylindrical passages that are open at both ends, the open passages and the closed passage are spaced at 90° relative to the other with a common intersection in the center of the closed passage;

a slidable, ferrous core, located in the closed passage having an aperture for fluid passage, located transverse to the longitudinal axis of the core, that will allow communication and fluid flow with the open passages across the valve when it is slidably aligned with the open passages to a first position;

a rod, fixedly attached at one end to the core and at the other end to a rod plate that fits within the closed cylinder;

an orifice plate, fixedly attached to the walls of the closed passage on the side of the core that is attached to the rod;

a spring, located around the rod between the orifice plate and the rod plate, the spring compresses when the core is moved to a first position, the spring being used to move the core to a second position;

main, high power windings, wrapped adjacently around the interior of the closed passage in a stacked, linear relationship for moving the slidable ferrous core along the closed passage to compress the spring when energized by a D.C. current, so that once the slidable ferrous core is moved to a first position, the core aperture aligns with the open passages to allow fluid flow therethrough;

lower power windings, wrapped around the interior of the closed passage in a stacked, linear relationship above the main windings;

a ferrous plug, located in the closed passage within the area of the low power windings, so that when the low power windings are energized by a D.C. current the ferrous plug will become an electromagnet to hold the slidable, ferrous core in the first position, and once the core is held in the first position the main windings may be deenergized;

a dielectric buffer, located between the ferrous plug and the slidable, ferrous core to separate and cushion the ferrous plug from the slidable core; and

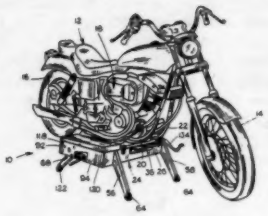
flowline means connected to said valve body, at the open cylindrical passages, for receiving fluid flow through the valve body, the flowline means adapted to be operably connected to a subsea production system which carries caustic, high volume fluid flow that is under high temperature and pressure.

4,681,299

MOTORCYCLE JACK

Louie P. Siebert, P.O. Box 654, Henderson, Nebr. 68371

Filed Dec. 4, 1985, Ser. No. 804,501
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—8 R **10 Claims**



1. A motorcycle jack comprising

a frame having longitudinally spaced apart forward and rearward ends and transversely spaced apart right and left sides,

a part of front and rear cross shafts extended transversely across said frame and rotatably supported thereon in longitudinally spaced apart relation,

a part of front legs having upper end portions mounted on said front cross shaft for rotation therewith, said front legs extending generally radially from said front cross shaft in generally parallel relation to one another,

a part of rear legs having upper end portions mounted on said rear cross shaft for rotation therewith, said rear legs extending generally radially from said rear cross shaft in generally parallel relation to one another,

means interconnecting at least one front leg and at least one rear leg so that said interconnected front and rear legs are constrained to pivotal movement in unison but in opposite directions, and

power means operatively connected to said interconnected legs for pivotally moving said interconnected legs relative to said frame whereby said frame is raised in response to pivotal movement of the lower ends of said interconnected legs toward one another and lowered in response to pivotal movement of the lower ends of said interconnected legs away from one another,

said cross shafts being formed of a resilient material capable of substantially complete recovery from limited torsional bending,

one front leg being rigidly linked to the rear leg on the same side of the frame, said rigid link having opposite ends pivotally connected to said interconnected front leg and rear leg at positions above and below the pivot axes thereof.

4,681,300

APPARATUS FOR REMOVING MANHOLE COVERS AND THE LIKE

Folke N. Drugge, 54 Lillsvangen, 126 57 Hagersten, Sweden

Filed Mar. 29, 1985, Ser. No. 717,520
Claims priority, application Sweden, Mar. 30, 1984, 8401754
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—131 **7 Claims**

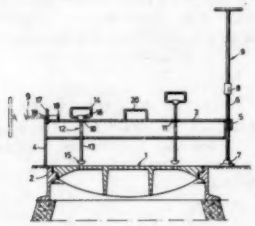
1. An apparatus for removing a manhole cover from a manhole, comprising:

a beam member having a first end and a second end;

means cooperating with said beam member for grabbing the manhole cover, said grabbing means including at least one grab element having a rod portion passing through said beam member intermediate said first and second ends and a catch portion at one end of said rod portion, said catch portion being adapted to detachably connect to the manhole cover;

means connected to said beam member for supporting said first end of said beam member a predetermined distance above a fulcrum position on a surface outside the perimeter of the manhole cover when the manhole cover is within the manhole;

raising means threadably connected to said beam member for adjustably supporting said second end of said beam member a variable distance above a pivot position on the surface outside the perimeter of the manhole cover when the manhole cover is within the manhole, said pivot position being substantially diametrically opposite said fulcrum position with respect to the manhole cover, whereby the manhole cover is raised from the manhole when the said catch portion of said grabbing means is connected to the manhole cover, said raising means including shoe means for pivotally supporting said beam member at said pivot position, a threaded collar member mounted on said beam member proximate said second end, and a screw spindle threadably engaged with said



threaded collar member and having one end pivotally connected to said shoe means; and

lifting means for lifting said first end of said beam member to a position above said predetermined distance above said fulcrum position and for pivoting said beam member about said pivot position, said lifting means including a spanner-shaped lever having a socket portion at one end thereof and a yoke member and quide means mounted on said beam member proximate said first end for receiving said socket portion of said lever, whereby the manhole cover connected to said catch portion of said grabbing means is pivotable to a position beside the manhole by lifting said lever and pivoting said lever about said pivot position when said lever is received by said yoke member and guide means, said socket portion of said lever being removable from said yoke member and guide means and engageable with the end of said screw spindle opposite said shoe means so that rotation of said lever and socket portion rotates said screw spindle.

4,681,301

ARRANGEMENT FOR LIFTING AND LOWERING OR FOR PULLING LOADS

Johannes Rinio, Herne, Fed. Rep. of Germany, assignor to N.V. Sky Climber Europe S.A., naamloze vennootschap, Belgium

Filed Jan. 3, 1986, Ser. No. 816,070

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501877; Nov. 19, 1985, 3540906

Int. Cl.[4] B66D *1/00, 1/30*

U.S. Cl. 254—333 **13 Claims**

1. An arrangement for moving a load, such as by lifting, lowering or pulling, having a flexible wire rope attached thereto, comprising:

(a) a housing having a rope inlet and a rope outlet;

(b) a first sheave half mounted in the housing so as to rotate about a central axis;

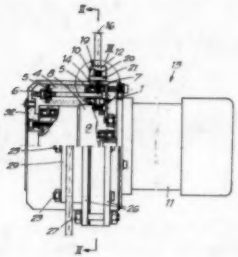
(c) a second sheave half mounted within the housing so as to rotate with the first sheave half;

(d) drive means to rotate the first and second sheave halves about the central axis;

(e) spring means to bias the second sheave half toward the first sheave half;

(f) a rope gripping groove defined by the first and second sheave halves to grip the wire rope such that rotation of the first and second sheave halves causes the wire rope to move along its length;

(g) a plurality of rope-supporting rollers attached to the housing such that the rollers are located adjacent to the



periphery of the first and second sheave halves so as to keep the wire rope from jumping out of the rope gripping groove, and are disposed around a major portion of the circumference of the first and second sheave halves;

(h) an axle attached to the housing and rotatably supporting each rope supporting roller; and,

(i) spring means acting between the housing and each rope supporting roller so as to bias the roller to a position above the rope gripping groove.

4,681,302

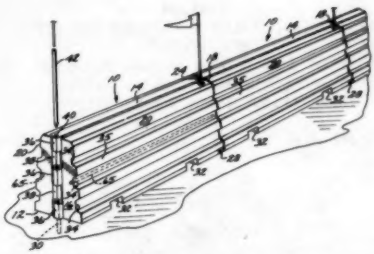
ENERGY ABSORBING BARRIER

Marion L. Thompson, 53 Woodlyn La., Bradbury, Calif. 91010

Continuation-in-part of Ser. No. 557,595, Dec. 2, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,662

Int. Cl.[4] E01F *15/00*

U.S. Cl. 256—13.1 **50 Claims**

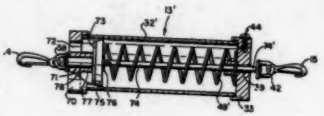


1. An energy absorbing barrier for dissipating kinetic energy upon impact by a moving vehicle, said barrier comprising:

an elongate container having walls, including a pair of longitudinally directed side walls, defining an interior chamber having a fill opening for admitting fluent material into said chamber, said container being configured and constructed of a material having a rigidity sufficient for said container to retain its shape both when said chamber is empty and when it is filled with said fluent material whereby said barrier is adapted to serve both as a self-supporting lightweight barrier and as a heavier barrier, respectively, said material further having a resilience sufficient to deform upon impact by a vehicle and recover its shape after said impact whereby an impacted one of said longitudinally directed side walls is adapted to progressively deform

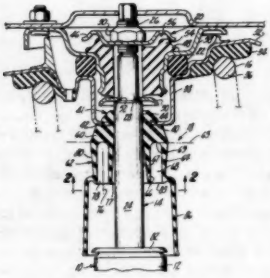
along its length as the impacting vehicle travels along said length, thereby progressively slowing said vehicle.

4,681,303
SHOCK-ABSORBENT CONNECTOR
Vincent R. Grassano, 41 Ridge Rd., Media, Pa. 19063
Continuation-in-part of Ser. No. 678,711, Dec. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 473,045, Mar. 7, 1983, Pat. No. 4,488,511. This application Aug. 26, 1985, Ser. No. 769,252
Int. Cl.[4] F16F *3/07*
U.S. Cl. 267—8 R **16 Claims**



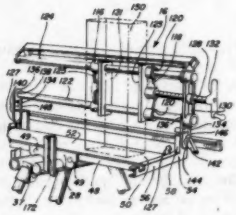
1. In a line connector having a clasping means at each end for joining two objects together, a device for absorbing shock resulting from sudden pull on the connector comprising
(a) a hollow cylinder including a piston disposed slidably therein,
(b) a cylinder end cap,
(c) a piston rod connected to the piston and extending through the end cap outwardly of the cylinder,
(d) fastening means for attaching the connector to the cylinder externally of the cylinder, whereby force from the pull on the connector is transmitted to the piston to cause the piston to advance in the cylinder toward the end cap,
(e) air conduit means in the end cap connecting the interior of the cylinder to the ambient atmosphere and
(f) an adjustable valve located in the air conduit means,
(g) said valve being operative to regulate discharge of air from the cylinder as the piston advances toward the end cap to control selectively compression of air within the cylinder, between the piston and the end cap, upon advancement of the piston, said compressed air within the cylinder functioning as resilient means yieldingly resisting the advance of the piston.

4,681,304
DEFLECTION JOUNCE BUMPER FOR STRUT SUSPENSION
Morris Hassan, Trenton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed Mar. 21, 1986, Ser. No. 842,589
Int. Cl.[4] F16F *1/36*
U.S. Cl. 267—8 R **4 Claims**



1. A suspension system for a vehicle including sprung and unsprung masses, said masses being separated by a spring bumper, said masses being located by a rod means so that distortion of the spring bumper occurs principally by axial compression, said bumper comprising an integral generally cylindrical body of elastic material such as rubber having opposed upper and lower end faces, said bumper having a solid upper hub portion closely encircling said rod means and a lower impact portion, said lower impact portion including a cylindrical outer wall section and a cylindrical inner wall section, said wall sections being concentrically disposed about said rod means and defining an intermediate cylindrical downwardly opening channel of predetermined radial extent and axial depth, said wall sections being integrally connected by a plurality of axially extending uniformly spaced paired bridging segments, each said pair of segments in the form of a pair of mirror image arcuate segments symmetrically disposed about a vertically extending column axis, each said pair of segments defining with adjacent interconnecting portion of said inner and outer walls an axial column blind bore with said pair of segments having their center of curvature on their associated column bore axis, such that upon aid bumper being impacted said inner and outer wall sections together with said column-like arcuate bridging segments stretching to absorb impact energy thereby providing initially high dampening load displacement resistance.

4,681,305
PORTABLE WORK DEVICE
Robert Green, 1222 W. Grand Ave., Chicago, Ill. 60622
Filed Aug. 2, 1985, Ser. No. 762,050
Int. Cl.[4] B25B *1/02*
U.S. Cl. 269—139 **7 Claims**



1. A vise assembly for use with a portable work device of the type having a table with a substantially planar, horizontally disposed primary work surface and a base for supporting the table in an elevated, working position, said vise assembly comprising:
a secondary work table with a secondary, upwardly facing surface for supporting a workpiece;
first and second jaw members;
means mounting the jaw members including an elongagte guide bar along the length of which each of the jaw members is adjustably adapted for translatory movement towards and away from each other in a first direction so that a range of workpiece size can be held firmly, captively between the jaw members;
the guide bar being connected to arm means pivotally mounting the guide bar and jaw members to the secondary table so that the guide bar and jaw members are pivotable together relative to the secondary work surface about a first axis extending substantially in said first direction;
means for selectively fixing the arm means relative to the secondary work table; and
means for pivotally mounting the jaw members to the arm means for pivoting movement of the jaw members together about a second axis that is spaced from and substantially parallel to the first axis,
whereby the jaw members can be reoriented and moved vertically relative to the secondary work surface with the secondary work surface in a horizontal situation and used to selectively hold a tool and workpiece in desired rela-

tionship to said secondary work surface to facilitate the preformance of work operations in conjunction with the primary work surface.

4,681,306

TWO CHAMBER ENGINE MOUNT WITH HYDRAULIC DAMPING

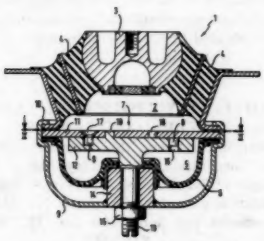
Manfred Hofmann, Hünfelden; Hans Müller, Höhr-Grenzhausen, and Ralf Waldecker, Neuwied, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,530

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410781

Int. Cl.⁴ F16F *9/10*; B60K *5/12*

U.S. Cl. 267—140.1 **4 Claims**



1. Two chamber engine mount with hydraulic damping, comprising rubber-elastic peripheral walls including a lower wall, a solid protective support housing disposed outside at least one of said walls, an orifice plate disposed between said walls defining upper and lower fluid-filled chambers above and below said orifice plate, said orifice plate being substantially horizontally divided into an upper plate half being stationary and a lower plate half being rotatable and having a central axis, said orifice plate having an orifice canal formed at least partly in said lower plate half interconnecting said chambers and having a given open length and cross section, a bushing passing through said support housing, and a centrally disposed pin integral with said lower plate half and extending outwardly fluid-tightly through said lower wall and said bushing for rotating said lower plate half about said central axis relative to said upper plate half, varying at least one of said length and cross section of said canal, said lower plate half having a lower surface having an outlet opening formed therein and an upper surface having said orifice canal gradually arcuately spirally rising therein starting from vicinity of said outlet opening and ending level with said upper surface, said upper plate half having an upper surface and a lower surface having an arcuate, inclined ramp-shaped projection formed thereon matching said orifice canal and having a flat end blending into an inlet opening passing through said upper plate half.

4,681,307

SOCKET CONSTRUCTION FOR TORSION MEMBER

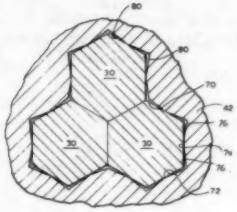
George H. Leonard, Darien, Conn., assignor to Airpot Corporation, Norwalk, Conn.

Filed Aug. 29, 1985, Ser. No. 770,614

Int. Cl.⁴ F16F *1/16*

U.S. Cl. 267—154 **14 Claims**

1. In a variable tension device comprising an elongated torsion member and a socket member having a body with an aperture of significant depth extending to a mouth and defined by walls at least some of which are shaped and oriented to engage sides of said torsion member when a portion of said torsion member is received within said aperture with another portion of said torsion member extending out beyond the mouth of said aperture, thereby to non-rotatably engage said torsion member in said socket member, said wall-side engagement producing the rotative stress between said torsion member and socket member when said other portion of said torsion member is twisted; the improvement which comprises said torsion member sides and said socket aperture walls engaging one another, when said torsion member is in an initial twist condition, at a first location relatively remote from the mouth of said aperture, said torsion member sides and aperture walls diverging from one another to a limited degree from said first location toward the mouth of said aperture, whereby said torsion member sides and aperture walls do not engage at locations closer to said aperture mouth than said first location



when said torsion member is in its said initial twist condition, the degree of the divergence from one another of said torsion member sides relative to said aperture walls being such that as said torsion member is further twisted from said initial twist position, at least some of said torsion member sides engage the aperture walls corresponding thereto at second locations closer to the mouth of said aperture than said first location while continuing such engagement essentially at said first location and at points between said first and second locations, thereby to progressively increase the area of engagement as said torsion member is increasingly twisted.

4,681,308

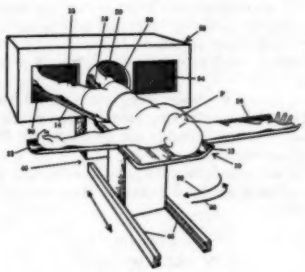
DIAGNOSTIC PATIENT SUPPORT APPARATUS

Paul Rice, Corp. 300 Foster St., Littleton, Mass. 01466

Continuation of Ser. No. 755,667, Jul. 16, 1985, abandoned. This application Jul. 24, 1986, Ser. No. 890,803

Int. Cl.⁴ A61G *13/00*

U.S. Cl. 269—322 **9 Claims**



1. A diagnostic patient support apparatus comprising:

a base; and

a table top structure rotatably mounted on said base at a central axis point corresponding to about the center of the chest area of a patient the table top including a central section for supporting the patient's torso, discrete leg extension sections connected to said central section and diverging therefrom at an acute angle for supporting the patient's respective legs, at least one arm extension section connected to said central section and extending therefrom

at about a right angle for supporting at least one of the patient's arms;

wherein the axes of said leg extension and said arm extension sections intersect at about the central axis point on said table top structure;

said base including wheel means mounted in a track means travelling toward and away from a diagnostic machine for moving said apparatus solely along the travel of said track means toward and away from said diagnostic machine.

4,681,309

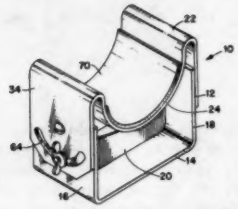
SURGICAL PREP BLOCK AND SURGICAL ASSIST BLOCK

Paula Lechner, 19 D'Arcy La., Asheville, N.C. 28804

Filed May 12, 1986, Ser. No. 862,293

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **5 Claims**



1. A surgical prep block or surgical assist block for supporting extremities, namely an individual leg, arm, hand, or foot comprising:

a stand having a base and a pair of opposing sides extending upwardly from said base;

an extremity support platform having a smooth substantially unbroken surface, said surface being configured as a deep inwardly projecting curve for receiving the extremity; and a pair of opposing sides extending downwardly from said surface;

each of said upwardly extending sides being attached to a corresponding downwardly extending side;

swivel means connected to the places where said sides are attached to each other, whereby said support platform will rotate with respect to said stand; said swivel means includes a hole in each of said sides at their respective place of attachment; said holes in each respective upward extending side aligning with said hole in each respective downward extending side;

a pair of rods, each extending through each pair of aligned holes;

a locking means for maintaining said support platform in a fixed position; said locking means includes a curved slot in at least one side in either the upwardly or downwardly extending sides;

clamping means attached through said slot and to the other side, which is attached to said at least one side.

4,681,310

SORTING APPARATUS

Thomas F. Cooper, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1985, Ser. No. 779,010

Int. Cl.[4] B42C *1/12*

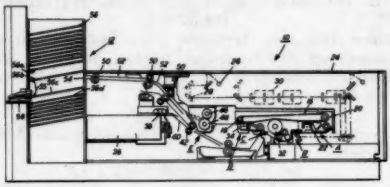
U.S. Cl. 270—53 **12 Claims**

1. An apparatus for sorting sheets, including:

a plurality of movable trays shiftable relative to one another;

means for supporting one edge of said plurality of trays with the remaining edges thereof extending freely from said supporting means;

means for moving successive trays from one side of a sheet inlet region to the other side thereof with said plurality of trays shifting relative to one another to provide a first wide entry region between adjacent trays at the sheet inlet region and a second wide entry region having one side thereof adjacent one side of the first wide entry region at a sheet securing region; and



means, positioned at the second wide entry region, for periodically attaching substantially permanently the sheets in the trays located thereat to one another.

4,681,311

INTERMITTENTLY PROTRUDING FEEDER FOR PAPERBOARD BLANKS

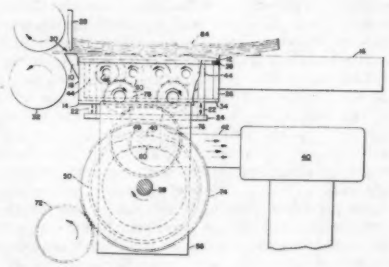
Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.

Continuation of Ser. No. 550,285, Nov. 9, 1983, Pat. No. 4,614,335, which is a continuation of Ser. No. 144,129, Apr. 28, 1980, abandoned. This application Jun. 23, 1986, Ser. No. 877,582

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] B65H *3/64*

U.S. Cl. 271—11 **7 Claims**



1. Apparatus for feeding corrugated blanks one by one from the bottom of a stack of blanks without slippage and so that the leading edge of the blank being fed always enters the nip of nip rolls at the same point in the machine cycle with precision suitable for printing and slotting, said apparatus comprising

a. nip rolls;

b. stack supporting structure including a forward portion;

c. transport means supported under said foward portion of stack supporting structure, said transport means comprising continuous high coefficient of friction surface adapted to be circulated;

d. reciprocating means for changing the relative vertical relationship of said high coefficient of friction surface and said forward portion of said stack supporting structure so as to alternately provide an active position where high coefficient of friction surface extends above the top of said stack supporting forward portion and a passive position where high coefficient of friction surface does not extend above the top of said stack supporting structure forward portion;

e. suction means for urging a blank downwardly into en-

gagement with high coefficient of friction surface in the active position;

f. transmission means comprising input shaft means which is adapted to be rotated and output shaft means which is adapted to be rotated, said input and output shaft means being operatively connected so that the output shaft means undergoes controlled acceleration during an initial period of each revolution of said input shaft means and is stationary during a last portion of each revolution of said input shaft means;

g. means operatively connecting the output shaft means of the transmission means and the transport means so that during the operation of the apparatus said high coefficient of friction surface is circulated and undergoes controlled acceleration followed by net deceleration to zero velocity;

the apparatus being such that the active position is effected directly before said high coefficient of friction surface undergoes controlled acceleration and the passive position is effected at the conclusion of the controlled acceleration; whereby high coefficient of friction surface of said transport means engages and grips the lowermost blank by static friction and moves and accelerates that blank to the nip rolls without slippage occurring and so that each blank enters the nip rolls in register whereupon the blank is disengaged from the transport means.

4,681,312

SHEET STACKER

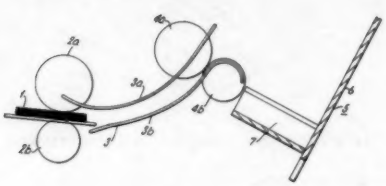
Raymond A. Harvey, St. Albans, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1986, Ser. No. 854,365

Claims priority, application United Kingdom, Apr. 23, 1985, 8510274

Int. Cl.⁴ B65H *31/02, 31/34*

U.S. Cl. 271—207 **9 Claims**



1. A sheet stacker comprising co-acting driven output rollers associated with means for directing sheets in an upwardly inclined direction, and an output tray for receiving sheets exiting the output rollers, said output tray comprising a support face inclined upwardly in the direction of sheet travel at an angle greater than that imparted to sheets by the output means such that the leading edges of the sheets contact the support face before the trail edges exit the output rollers, the output tray further comprising base edge support means arranged such that after exiting the output rollers the sheets slide under their own weight trail edge first down the support face of the output tray until they abut said base edge support means, characterised in that the base edge support means in the plane of the support face is arranged in a downwardly inclined direction and comprises at the lower end thereof a corner registration stop, and in that a fulcrum is provided at the upper end of the base edge support means, the fulcrum being arranged such that when the sheets slide down the support face their trail edges abut the fulcrum intermediate their edges remote from the registration corner stop and the centre of the sheets, whereby the sheets rotate under their own weight about said fulcrum until their trail edges abut the base edge support means, the inclination of the base edge support means being such that the sheets slide on their trail edges down the base edge support means until the edges of the sheets facing the corner registration stop abut said stop.

4,681,313

PHOTOSENSITIVE PAPER CONVEYING DEVICE OF A COPYING MACHINE

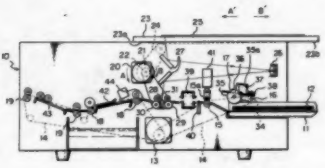
Yasuyuki Yokovama; Kiyoaki Nakamura, both of Hachioji; Hiroshi Goi, Tachikawa, and Koichiro Fujioka, Yokohama, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,597

Claims priority, application Japan, Nov. 29, 1984, 59-250395

Int. Cl.⁴ B65H *5/06*

U.S. Cl. 271—273 **6 Claims**



1. A photosensitive paper conveying device of a copying machine comprising:

a body;

an original carrier movably mounted on said body;

a photosensitive paper receiving member attached to said body;

an image-forming station forming an image on a photosensitive paper;

photosensitive paper conveying means located downstream of said photosensitive paper receiving member, conveying a photosensitive paper from said photosensitive paper receiving member to said image-forming station;

said photosensitive paper conveying means including a first pair of rollers located apart from said image-forming station and between said photosensitive paper receiving member and said image-forming station, holding therebetween and conveying a photosensitive paper, and including a second and a third pairs of rollers positioned adjacent to and upstream and downstream of said image-forming station, respectively, holding therebetween and conveying a photosensitive paper, said second and third rollers rotating at the same circumferential speed and operating synchronously with the movement of said original carrier during formation of an image on said photosensitive paper; and

said first rollers being provided with release means, and the photosensitive paper held by said first rollers being released before said photosensitive paper passes said image-forming station.

4,681,314

OSCILLATING DEVICE HAVING IMPROVED SUPPORT LEGS

Robert C. Swengel, Sr., York, Pa., assignor to Donsco Incorporated, Wrightsville, Pa.

Continuation-in-part of Ser. No. 629,334, Jul. 10, 1984, Pat. No. 4,575,071. This application Apr. 22, 1985, Ser. No. 726,226

Int. Cl.⁴ A63G *17/00*

U.S. Cl. 272—52 **11 Claims**

1. An oscillating device, comprising:

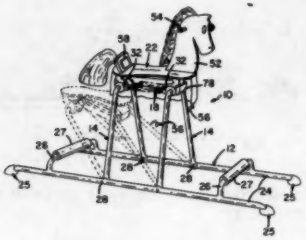
a base;

a pair of front and rear leg assemblies with each pair pivotally mounted on parallel axes at lower ends thereof to said base and extending upwardly therefrom, said leg assemblies each including a pair(s) of leg members and a pair of mounting members, each said leg member(s) being pivotally mounted at the lower end(s) thereof to said base, each

said mounting member(s) being an inverted L-shaped bearing support member having the end of the leg portion secured to the upper end of said leg member with the free end portions of the base of the inverted L-shaped bearing support members of the front leg members opposing the free end portions of the support members of the rear leg members (having first sections secured to upper ends of said leg members and second sections extending substantially normal with respect to said first section);

a pair of support-bearing means having one secured between the bases of the front support members and one secured between the bases of the rear support members (said first sections of opposed mounting-members);

a pair of mounting bearing means having one secured between the free end portions of the front support members



and one secured between th free end portions of the rear support members (energy-storing means secured between said second sections of opposed mounting members);

body support means having oppositely opening bearing-receiving means in which said support-bearing means are respectively disposed; and

energy storing means mounted onto and extending between said opposed mounting bearing (energy-stored support) means to maintain said support-bearing means within said bearing-receiving means, to maintain said body support means centered in a normally vertical position of rest and to move said body support means back toward said centered normally vertical position when said body support means is moved to each side of said vertical position during oscillatory movement thereof.

4,681,315

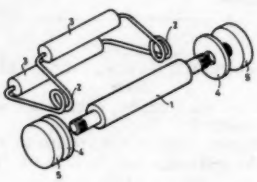
DUMBBELL WITH DOUBLE COVER HAND PROTECTOR AND GRASPING TRAINING FUNCTION

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jun. 26, 1985, Ser. No. 748,848

Int. Cl.[4] A63B *11/08*

U.S. Cl. 272—122 **6 Claims**



1. An exercising device comprised, in combination, of: an elongated weight bar having reduced portions at each end thereof, thereby defining an annular shoulder on the weight bar, each of said reduced end portions being threaded; a resilient torsion spring member having first and second torsion springs, said torsion springs being positioned substantially parallel to one another for receiving a respective said reduced end portion of the bar therethrough, such that each of said springs is received against a respective annular shoulder, said first and second torsion springs each having a pair of spring legs extending therefrom, said spring member further having a pair of rod members, each of said rod members being positioned between, and integrally formed with, a respective spring leg of each torsion spring, said rod members being further positioned on substantially parallel axes to one another; and at least two weight members, each having a threaded aperture formed therein for engaging a respective threaded portion of the weight bar, thereby securing the respective weight member to the bar.

4,681,316

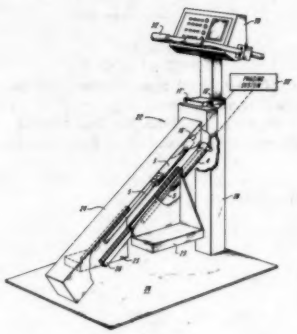
PHASING SYSTEM FOR EXERCISE STAIR

Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104

Filed Aug. 2, 1984, Ser. No. 636,907

Int. Cl.[4] A63B *21/00, 23/04*

U.S. Cl. 272—130 **6 Claims**



1. An exercise system having linearly reciprocating steps comprising:

a pair of stair steps;

a frame;

a pair of hydraulic cylinders, each having a piston coupled to a respective stair step, and respectively mounted to said frame such that the pistons linearly reciprocate in response to pressure applied to the respective steps;

intercylinder fluid coupling means including intercylinder fluid coupling passages for fluid coupling each side of each of the cylinders together on corresponding sides of their pistons so that the movement of one piston by its associated step moves the other piston in the reverse direction by action of the fluid moving in the intercylinder fluid coupling means;

bypass means including at least one bi-directional fluid coupling passage and valve means therein, for selectively coupling when the valve means is in an open position, the fluid on one side of at least one of the pistons to the fluid on the other side of said at least one piston;

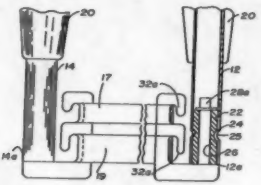
said bypass means operative with the valve means in an open position, to permit fluid coupling through the bi-directional fluid coupling passage to allow adjustment of relative piston position and range of motion; and said bypass means further operative with

said valve means in a closed position to block fluid coupling through the bi-directional fluid coupling passage during exercise use.

4,681,317
GOLF EXERCISE DEVICE

John R. Brandell, 427 Shore Line Rd., Barrington, Ill. 60015

Filed May 10, 1985, Ser. No. 733,592
Int. Cl.[4] A63B 21/02
U.S. Cl. 272—137 19 Claims



1. An exercising device comprising:

a pair of elongated tubular handle members each having an end portion and a gripping portion extending substantially the length of said elongated tubular handle members opposite said end portions, with each of said end portions providing a tubular shaft,

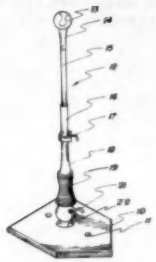
wherein at least one of said end portions of said pair of tubular handle members includes a sleeve-bearing mounted within said tubular shaft to provide an axis of rotation thereon and a spinner member rotatably secured on said said sleeve-bearing, with said spinner member including a shaft portion rotatably secured to said sleeve-bearing and a hook portion positioned outside the outer surface of the tubular handle member, and

resilient means secured to one of said end portions and to said hook portion of said spinner member and interconnecting together said ends of said pair of handle members, with said resilient means applying a variable resistance against the reactive universal movement of the pair of handle members with respect to each other.

4,681,318
BALL HITTING PRACTICE DEVICE

William C. Lay, St. George, Utah, assignor to Grand Slam, Inc., Midvale, Utah

Filed Jun. 17, 1986, Ser. No. 875,065
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—26 R 8 Claims



1. An adjustable ball hitting practice device comprising in combination;

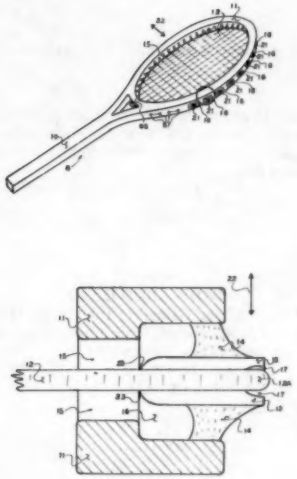
a. a planar base adapted to being secured to a solid surface, and

b. a vertical pedestal fixedly attached to the top surface of said bse, said pedestal comprising a first vertically extending resilient member having a ball fixedly attached to one end thereof and having its other end fitting into the upper end of a second vertically extending resilient tubular member in telescopic manner so as to permit said first resilient member to be adjusted up and down, locking means to secure said first resilient member in a desired position, an elongated coil spring having one of its ends fixedly attached to the bottom end of said second resilient member permiting the entire vertical pedestal to bend when the ball is hit, pivoting means fixedly attached to the other end of the coil spring and to the surface of the planar base, said pivoting means permitting said vertical pedestal to be inclined to the side, front or back and then fixedly located in a desired position by locking means.

4,681,319
RACKET HAVING UNIQUE STRING MOUNT

Gene Zilinskas, 17536 Lemay St., Vay Nuys, Calif. 91406

Continuation-in-part of Ser. No. 948,691, Oct. 5, 1978, abandoned, and a continuation-in-part of Ser. No. 1,941, Jan. 8, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 303,361
Int. Cl.[4] A63B 49/02
U.S. Cl. 273—73 D 19 Claims



1. A compliant system comprising:

a string for interacting with an object;

transverse compliance means for providing transverse compliance of said string in response to interaction with an object, wherein said transverse compliance means includes

(a) a string support rail for providing transverse motion of said string,

(b) a pin for attaching said string support rail to a frame structure, and

(c) elastic material for providing transverse compliance of said string in response to the transverse motion; and

a frame structure for mounting said transverse compliance means.

4,681,320
TOP AND BOARD THEREFOR

Edmund Hildebrandt, 6 Cedar St., Clinton, Mass. 01510

Filed Mar. 28, 1986, Ser. No. 845,548
Int. Cl.[4] A63B 67/14, 9/16
U.S. Cl. 273—109 3 Claims

1. A toy spinning top and a supporting game board for the top, comprising

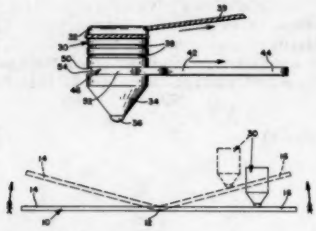
a top having a cylindrical body with a downwardly tapering portion terminating in a spinning point, means to spin the top,

a diagram on the game board indicating a proposed path for the top,

the game board being manipulatable to incline it to a selective inclinations relative to the horizontal with the top spinning thereon,

said game board being bare and plain and lacking (handles or) edge fences, whereby the top is more easily spun thereon with a single cord wrapped thereon with respect to the cylindrical portion of the top (.),

the game board being foldable on a diametric line, so that the



top may be energized with the entire game board co-planar and horizontal, and the folded parts of the board may be placed at selectively variable angles while the top spins on either part.

4,681,321

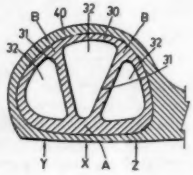
GOLF CLUB HEAD

Chin-Chi Chen, 92,Tung HsingRd., Tung Hsing Tsun, Tali, and Yung-Shing Lin, 4,Lane485, Sec.2, Chung Shan Rd., Tan Tzu, both of Taichung Hsian, Taiwan

Filed Jan. 29, 1986, Ser. No. 823,753

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—167 H **4 Claims**



1. In a golf club head having a neck portion by which the golf club head may be attached to a shaft for use as a golf club, and in which the golf club head includes a molded synthetic plastic resin outer body member having an upwardly convexly arcuate top wall, a fan-shaped, generally flat, front hitting plane wall, a rearwardly convex arcuate rear wall and a generally flat bottom plate, all merging into one another at respective margins, with the neck extending upwards from the top wall near one end of the front hitting plane wall,

the improvement wherein:

said golf club head comprises a hollow inner body having an outer surface, and said outer body member completely envelops said inner body and is intimately in contact with said outer surface throughout substantially all of said inner body; and

said inner body further includes at least two generally vertical internal partition walls which integrally extend from said bottom plate to said top wall and from said front hitting plane wall to said rear wall and divide said inner body, internally thereof into at least three separate compartments, with said partition walls being disposed to perform, in use, as respective force bridges.

4,681,322

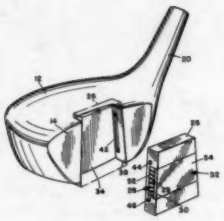
GOLF CLUB HEAD

George T. Straza, and George C. P. Straza, both of P.O. Box 1292, Rancho Santa Fe, Calif. 92067

Filed Sep. 18, 1985, Ser. No. 777,219

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—173 **11 Claims**



7. An insert for a golf club head, comprising:

an insert member shaped to fit in a channel in the front face of a golf club head, the member having a front, ball striking face for lying flush with the front face of a golf club head, and interlocking means for securing the member to a golf club head;

the insert member having a cut out in its front face;

a cellular, honeycomb structure secured within the cut out;

the honeycomb structure comprising a plurality of adjoining, elongated, open cells orientated perpendicular to the front face of the insert member; and

resilient material filling the cut-out around the cells to form a front face flush with the front face of the insert member.

4,681,323

GOLF BALL

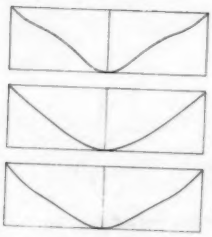
Yasuhide Alaki, Saitama; Masayuki Ohtake, Yokohama, and Keisuke Ihara, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,438

Claims priority, application Japan, Feb. 7, 1984, 59-20419

Int. Cl.[4] A63B *37/14, 37/02*

U.S. Cl. 273—232 **10 Claims**



1. A golf ball having a plurality of recessed dimples on the surface thereof, wherein said dimples have a shape wherein the value of the spatial volume of each dimple below a plane defined by an edge of the dimple divided by the volume of a cylinder wherein the bottom of said cylinder is defined by said plane and the height is determined by the maximum depth of the dimple from said plane, is within the range from 0.35 to 0.43, wherein the maximum diameter of the dimple is within the range of 2–4 mm and the maximum depth of the dimple is within the range of 0.1–0.4 mm, said dimples representing at least 90 percent of the total number of dimples on said golf ball.

4,681,324
HOLOGRAPHIC GAME CARDS

Razmik Karabed, 287 Tradewinds Dr., San Jose, Calif. 95123, and Raphael Mehrbians, 544 Marine World Pkwy., Redwood City, Calif. 94065

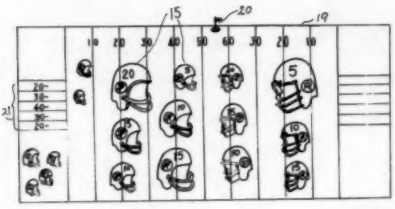
Filed Jan. 9, 1986, Ser. No. 817,414
Int. Cl.[4] A63F *1/02*
U.S. Cl. 273—295 9 Claims

9. A game piece having:
(a) a game piece front surface which bears indicia related to a game activity or value;
(b) a holographic member forming a first holographic image disposed on at least a portion of said front surface and constituting at least a part of said indicia;
(c) said holographic member constituting means affording a substantially unimpeded view of the image in a relatively narrow and limited range of direction with respect to said front surface and to be substantially indistinguishable at directions outside of said narrow and limited range.

4,681,325
GAME TOY

Sang K. Sheem, 2616 Starling Ct., Pleasanton, Calif. 94566

Filed Apr. 11, 1985, Ser. No. 722,230
Int. Cl.[4] F41J *3/00*
U.S. Cl. 273—345 17 Claims

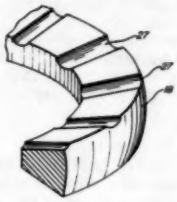


1. Apparatus for playing a football dart game comprising:
a game board for receiving darts, said game board being designed to be recognizable as a simulated football field with the lines and yardage markers that typify the football field;
a plurality of offensive targets arranged on said game board, each offensive target containing identifications representing at least one of various play options available to be used by an offensive team in a football game; and
a plurality of defensive targets arranged on said game board, each defensive target containing identifications representing at least one of various defensive play options available as the corresponding defensive countermeasures against the offensive play options of said offensive targets, and to be used by a defensive team;
each of said offensive and defensive targets being an individually distinct target and with a corresponding defensive target marked to counteract an offensive play option being provided for each offensive target marked to indicate an offensive play option in the game of football;
wherein said offensive targets are positioned on one side of the 50 yard line of said football field and said defensive targets are positioned on the other side of said 50 yard line;
so that two players or groups of players may play said football dart game in an interactive sequence of alternate dart throws by the two players or groups of players representing the offensive and defensive teams respectively.

4,681,326
GAS LUBRICATED PISTON RING ASSEMBLY

Isoroku Kubo, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 10, 1985, Ser. No. 742,910
Int. Cl.[4] F16J *9/08, 9/12*
U.S. Cl. 277—27 6 Claims



1. A piston ring assembly comprising:
a piston member,
an annular groove in said piston member positioned proximate to the lower end of said piston member,
a circumferentially extending ring positioned in said annular groove adapted for sealing engagement with said cylinder wall,
said ring being dimensioned to provide a clearance between said annular groove and the bottom and the radially inward surfaces of said ring and having gas flow means on the upper surface thereof whereby upon downward movement of the said piston member gas is permitted to flow up and around said ring so as to be trapped in the axial space between said piston and said cylinder wall above said ring to thereby form a gas bearing for the piston.

4,681,327
COMPOUND SEAL WITH PRESSURE EQUALIZATION APERTURE

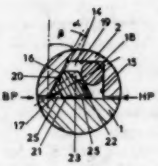
Guy d'Agostino, Vitry; André Dhainaut, Dammarie les Lys; Daniel G. A. Kettler, Chartrettes, and Henry R. Leclerc, Juvisy sur Orge, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", France

Filed Nov. 25, 1986, Ser. No. 934,831
Claims priority, application France, Nov. 25, 1985, 85 17745
Int. Cl.[4] F16J *15/10*
U.S. Cl. 277—29 17 Claims

1. A compound seal for effecting a seal between a shaft element having a longitudinal axis and a sleeve element wherein one of the elements is movable with respect to the other of the elements and defines a high pressure zone and a low pressure zone comprising:
(a) an annular groove defined by one of the elements, the groove having a low pressure side, a bottom and a high pressure side;
(b) a sealing member disposed in the annular groove, the sealing member having a first sealing side bearing against the low pressure side of the annular groove, a second sealing side bearing against the other of the elements and

at least a third side extending substantially perpendicular to a bisector of an angle subtended by the first and second sides;

(c) an annular clamping member bearing against the bottom and the high pressure side of the groove, and against the third side of the sealing member so as to exert a force on the sealing member in substantially the direction of the



bisector so as to urge the first and second sides in sealing contact with the low pressure side and the other of the elements, respectively; and,

(d) at least one aperture definded by the sealing member and extending in a generally radial direction on either side of the clamping member so as to allow equalization of pressure on either side of the clamping member.

4,681,328

MAGNETIC LIQUID SHAFT SEAL

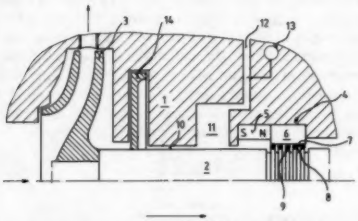
Klaus Ritter, Hirschberg; Klaus Michaelsen, Hassloch, and Gunther Mair, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 6, 1986, Ser. No. 927,367

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539777

Int. Cl.[4] F16J *15/40*

U.S. Cl. 277—80 **4 Claims**



1. A shaft seal which contains a magnetic liquid, for pump shafts or the like, comprising a permanent magnet which surrounds the shaft, is a distance away from the latter, is fastened in the bearing housing of the shaft and has one or more pole pieces which, together with the shaft surface, form an air gap in which the magnetic liquid is held by the magnetic field and which is sealed as a result, wherein a volume of inert gas which surrounds the shaft is present between the magnetic liquid seal and the shaft channel to the medium.

4,681,329

HIGH VACUUM GATE VALVE HAVING IMPROVED METAL VACUUM SEAL JOINT

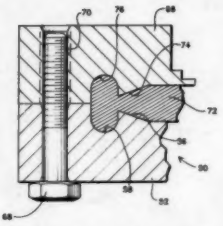
Jose L. Contin, Orinda, Calif., assignor to MDC Vacuum Products Corporation, Hayward, Calif.

Filed Jul. 2, 1986, Ser. No. 881,074

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—167.5 **4 Claims**

1. A flange for providing a high vacuum generally rectangular joint in combination with a second flange of mirrored geometry and a metal gasket compressed and swaged therebetween to achieve a high vacuum seal at the joint, the flange comprising a substantially planar face, a generally rectangular, continuously formed trough defined in said face, said trough being substantially semicircular in cross section, and a raised



susbtantially planar swaging surface continuously formed adjacently inward of and abutting said trough, said swaging surface having an outward upward slope angle with respect to said face.

4,681,330

HAND TRUCK

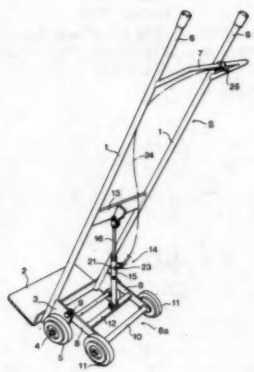
Rintaro Misawa, Tokorozawa, Japan, assignor to Sunwa Sharyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,571

Claims priority, application Japan, Dec. 14, 1984, 59-189580[U]

Int. Cl.[4] B62B *1/08*

U.S. Cl. 280—47.2 **5 Claims**



1. A hand truck comprising:

a load supporting frame having a handle at an upper end portion thereof;

a load supporting platform provided on a lower portion of the load supporting frame;

a pair of main wheels provided on a lower portion of the load supporting frame;

an auxiliary frame pivotally mounted on a lower portion of the load supporting frame;

a pair of auxiliary wheels provided on a trailing end of the auxiliary frame;

extensible cylinder means provided between the load supporting frame and the auxiliary frame so as to keep the load supporting frame at a desired position, the cylinder means including a cylinder and a rod slidably mounted in the cylinder, one of said cylinder and rod being pivotally connected at a lower end thereof to the auxiliary frame at

a location inboard of said trailing end, and a spring wound on the rod and secured to the cylinder at both ends thereof so as to lock the rod by contraction thereof, the other of said cylinder and rod being pivotally connected to the load supporting frame at a connection position lower than a half of the length of the load supporting frame; and

operating means for operating the cylinder means, said operating means including a wire for expanding the spring to release the rod, and a lever provided on the handle for pulling the wire to release the rod.

4,681,331

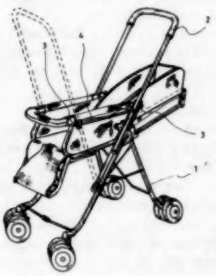
PERAMBULATOR

Dieter Glüser, Dachau, Fed. Rep. of Germany, assignor to Peg Perego Pines S.p.A., Milan, Italy

Filed Oct. 9, 1984, Ser. No. 658,794

Int. Cl.[4] B62B 7/06

U.S. Cl. 280—47.36 **6 Claims**



1. A baby carriage comprising:

a frame;

a seat coupled to the frame adapted to receive a child;

a push bar assembly pivotally connected to both sides of said frame and adapted to be locked at a forward position and a rearward position;

two stop members (3) for limiting the pivotal movement of said push bar assembly provided on each side of same frame (1); and

a manually operable elongated locking element (4) adapted in its rest position to prevent said push bar assembly from being pivoted from one position to the other and longitudinally interposed at an intermediate location between said two positions,

said locking element (4) being coupled to a center portion of a guide rod (5) connecting said stop members (3) and having end portions projecting into the pivoting path of said push bar assembly (2),

said locking element (4) being of U shaped configuration between said end portions

each of said end portions of said locking element (4) being adapted to be alternately displaced transversely towards said guide rod (5) for the release of said push bar assembly (2).

4,681,332

MOBILE VEHICLE FOR TRAINING SKATERS

Don Malone, Martin, Tenn., assignor to University of Tennessee Research Corporation, Knoxville, Tenn.

Filed May 21, 1986, Ser. No. 865,535

Int. Cl.[4] A63C 3/04

U.S. Cl. 280—87.02 R **15 Claims**

1. A mobile vehicle for training skaters comprising

a narrow straddlebar extending forwardly and upwardly;

a front leg attached to the front of said straddlebar extending downwardly and forwardly;

a rear leg attached to the rear of said straddlebar extending downwardly and rearwardly for a considerable distance, said straddlebar being substantially the only structural support said front leg and said rear leg;

a horizontal, transversely extending basebar having a left and right outermost end attached to the bottom end of said front leg;

a horizontal, transversely extending basebar having a left and right outermost end attached to the lower end of said rear leg;

a swiveling wheel attached near said left and right outermost ends of said horizontally extending basebars;

a bicycle-like seat mounted above the top of said rear leg at an elevation adjacent to rear of said straddlebar; and

a handlebar attached and fixed against swiveling above the top portion of said front leg.

4,681,333

WIND PROPELLED LAND VEHICLE

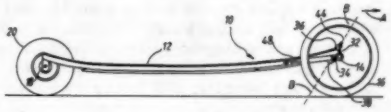
Anthony Rouge, Boysenstrasse 1, D-3200 Hildesheim, and Joachim Schulze, Harsum-Asel, both of Fed. Rep. of Germany, assignors to Anthony Rouge, Hildesheim, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,309

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338946; Oct. 27, 1983, 8330835[U]; Dec. 21, 1983, 3346905; Dec. 21, 1983, 8337165[U]

Int. Cl.[4] A63C 17/04

U.S. Cl. 280—87.04 A **11 Claims**



1. A wind propelled land vehicle, comprising:

(a) a footboard having first and second ends and upper and lower surfaces;

(b) a front axle disposed at the first end of said footboard;

(c) a rear axle disposed at and fixedly mounted to the second end of said footboard;

(d) steering means for said vehicle including a steering head mounted centrally on said front axle, said steering head comprising two spaced bushes aligned along an axis inclined to the direction of movement of said vehicle, a first one of said bushes being disposed on said axis below and to the rear of a second one of said bushes, a sleeve mounted to said footboard and having an inclined axis coinciding with the axis of said bushes, and a steering pivot pin connecting said two buses axially with said sleeve, said first bush being disposed below said lower surface of said footboard and said second bush being disposed above said upper surface of said footboard;

(e) spaced motion apart means mounted on said front axle for permitting movement of said vehicle over a surface, said spaced apart motion means being symmetrically located with respect to the longitudinal axis of said footboard;

(f) single means mounted on said rear axle for permitting movement of said vehicle over a surface; and

(g) steering damper means comprising spaced apart shock absorbers mounted symmetrically with respect to said steering head and connecting said front axle to said footboard in an articulated manner.

4,681,334

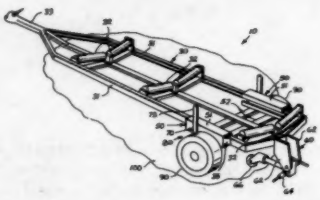
BOAT LAUNCHING APPARATUS

William D. O'Brien, Jr., 4483 Francis Ct., Lilburn, Ga. 30247

Filed Jul. 7, 1986, Ser. No. 881,949

Int. Cl.[4] B60P *3/10*

U.S. Cl. 280—414.1 **6 Claims**



1. A trailer assembly for transporting, launching and loading boats comprising, in combination, a carriage assembly for carrying a boat, and a transport assembly for supporting said carriage assembly;

said carriage assembly having first and second, laterally spaced longitudinal frame members extending from the front to the rear of said carriage assembly, the front ends of said longitudinal frame members having means for directly connecting said carriage assembly to a towing vehicle, said first and second frame members extending through first and second elongated housing members respectively, said housing members being affixed to said transport assembly and adapted to permit free longitudinal movement of said frame members relative to said transport assembly in a single plane;

said transport assembly comprising first and second transport wheels mounted to said first and second housing members respectively, and locking means mounted on at least one of said housing members and adapted to engage at least one of said longitudinal frame members to prevent relative movement between said carriage assembly and said transport assembly, said locking means including means for disengaging said locking means from said longitudinal frame member to permit free longitudinal movement of said carriage assembly relative to said transport assembly;

said transport assembly further including braking means for locking said transport wheels; and

a load bearing wheel assembly comprising a pair of laterally spaced plates affixed to the rear end of said carriage assembly, a support shaft having one end pivotally mounted between said plates so as to be movable between an operating position wherein the support shaft is perpendicular to said carriage assembly and a transport position wherein said support shaft is substantially parallel to said carriage assembly, a detent shaft mounted between said plates for holding said support shaft in either of said positions and means for releasing said detent shaft to permit movement of said support shaft between the two positions, and a load bearing wheel rotatably mounted to the other end of said support shaft, said load bearing wheel assembly including means to adjust said load bearing wheel up or down when said support shaft is in the operating position for causing said load bearing wheel to contact the ground, thereby supporting the rear end of said carriage assembly.

4,681,335

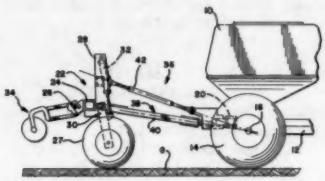
CENTER PIVOT HITCH ASSEMBLY

Donald L. Ledermann, Darien, and Ronald L. Otten, Naperville, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 6, 1986, Ser. No. 836,730

Int. Cl.[4] A01B *59/042*; B60D *1/00*

U.S. Cl. 280—446 R **3 Claims**



1. An agricultural implement hitch assembly and stabilization arrangement, comprising:

a tool bar adapted to receive associated ground-working tools, said tool bar being provided with means for effecting vertical movement of the tool bar between raised and lowered positions;

a wheeled implement including a pair of laterally spaced wheels defining a transverse wheel axis;

frame means rigidly connected to and extending forwardly of said tool bar;

means pivotally connecting a forward end portion of said frame means to a backside of said wheeled implement whereby said tool bar is laterally pivotable relative to said wheeled implement, said frame means including first lower linking means and second upper linking means arranged in non-parallel relation, said second upper linking means being positioned to direct an overhung load created on said tool bar in said raised position thereof substantially along said transverse axis of said sheeled implement; and

hydraulic stabilization means extending between and connected with said wheeled implement and said frame means, said stabilization means comprising extensible hydraulic fluid actuator means, and means for controlling fluid flow into and from said actuator means for selectively (1) fixing the effective length of said actuator means to maintain said tool bar in a fixed, generally perpendicular disposition relative to the longitudinal axis of said wheeled implement, and (2) controlling said actuator means to stabilize movement of said tool bar relative to said wheeled implement;

wherein in said raised position of said tool bar, said upper and lower linking means of said frame means are arranged in forwardly converging relation to each other, with the upper and lower linking means respectively defining lines of action which intersect generally at said transverse wheel axis of said wheeled implement.

4,681,336

VARIABLE LENGTH LINK FOR A THREE-POINT HITCH

Robert Kryscyk, Ketsch, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Mar. 28, 1986, Ser. No. 845,716

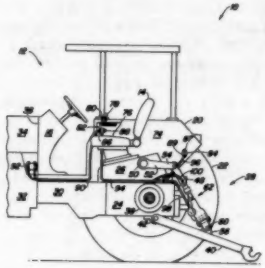
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512428

Int. Cl.[4] B60D *1/14*

U.S. Cl. 280—482 **7 Claims**

1. A variable length link for a vehicle power lift system adapted to connect a working implement to the vehicle, the link comprising: first and second spaced apart anchor elements defining the ends of the link, the first anchor element having a portion with a threaded opening, a spindle having one end rotatably connected to the second anchor element and a

threaded portion engaged in the threaded opening of the first anchor element, a motor carried by the second anchor element and having a power output, and means interconnecting the motor and spindle for increasing the power of the motor output and rotating the spindle whereby the threaded engagement between the spindle and first anchor element causes the spindle



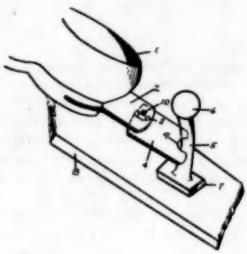
to move in the direction of its major axis relative to the first anchor element and change the effective length of the link, said means including a first step-down transmission driven by the motor and driving a second step-down transmission, the second step-down transmission includes a worm gear driven by the first step-down transmission and a toothed wheel on the spindle in engagement with the worm gear.

4,681,337

SAFETY SKI HARNESS

John D'Arcy Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Filed Apr. 25, 1986, Ser. No. 855,926
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—615 **1 Claim**



1. A boot binding device for removably holding a ski boot to a ski that permits vertical movement of the ski boot and restrains lateral movement of the boot and that releases the boot in an accidental fall comprising:

a curved ski rod fixed to the ski and curved to follow the arc traced by the ski boot heel as it moves vertically with the toe of the boot fixed about a pivotal point,

a rod plate having a cut away groove at one end to accommodate said ski rod,

a boot plate fixed at one end to said ski boot and connected to said rod plate by a pivot pin that extends through holes in the plates at their other ends, said pivot pin having an adjustment means to adjust the bias of the two plates towards each other and thus adjust the extent of lateral retention of the boot,

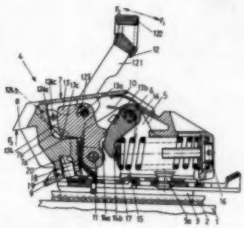
in the event of a fall the two plates pivot about the pivot pin to release the boot from the lateral retention of the ski rod.

4,681,338

SAFETY SKI BINDING

Engelbert Spitaler, Neudorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jul. 15, 1985, Ser. No. 755,177
Claims priority, application Austria, Jul. 13, 1984, 2267/84
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—628 **10 Claims**



1. In a safety ski binding having a sole holder which can be pivoted about a transverse axis between a downhill skiing position and an open position relative to a base member, which is releasably held in its downhill skiing position by a resilient locking member which acts onto the sole holder through a locking mechanism, and which is supported on the base member, wherein the locking mechanism includes a control surface which is constructed on a rear region of the sole holder and includes a locking lever which is supported on the base member for movement about a swivel axis, the locking lever pivotally supporting a two-arm release lever on a portion thereof which extends above the swivel axis, a first arm of the release lever being a load arm which grips under a portion of the sole holder and a second arm thereof being a force arm which is constructed as an operating lever, and wherein movement of the release lever in a release direction counteracts, through compression of the resilient locking member, the resilient force acting on the locking mechanism so that the sole holder can be swung upwardly from its downhill skiing position to its open position substantially free of resistance from the locking mechanism, the improvement comprising wherein the release lever has an extension which can engage the sole holder and which, when the sole holder is in its open position and the release lever is moved in a closing direction, engages the sole holder and moves the sole holder to its downhill skiing position.

4,681,339

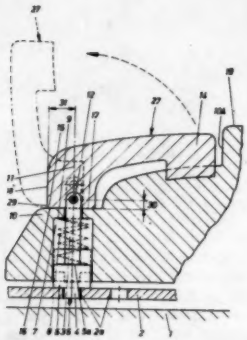
SKI BINDING PART, IN PARTICULAR A FRONT JAW

Alois Himmetsberger; Radko Pavlovec; Heinz Wittmann, all of Vienna; Hubert Wuerthner, Hainburg; Tibor Szasz, Vienna; Kurt Liedl, Petronell, and Roland Erdei, Pottendorf, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 726,522, Apr. 24, 1985, abandoned.
This application Sep. 22, 1986, Ser. No. 910,317
Claims priority, application Austria, Apr. 27, 1984, 1419/84
Int. Cl.[4] A63C 9/22
U.S. Cl. 280—633 **17 Claims**

1. In a front jaw of a ski binding having a guide rail adapted to be fastened to an upper side of a ski and having support means thereon for supporting a jaw unit for movement in a longitudinal direction of said ski, said jaw unit having a housing and a locking means for locking said jaw unit in predetermined adjusted positions on said guide rail, said locking means including a locking part which is movably held on said jaw unit and a resilient means for continually urging said locking part into a form-locking selective engagement with a complementary locking recess on said guide rail, said front jaw having an operating member and means for operatively connecting said operating member to said locking part for effecting a disengagement of said locking part from said complementary

locking recess, the improvement comprising wherein said housing has means defining a recessed portion therein, wherein said operating member is connected to said locking part at a support point and is provided with first and second surfaces defining an angle therebetween, each surface being spaced a different distance from said support point, said first surface engaging said housing when said locking part is engaged in said locking recess, said second surface engaging said housing when said locking part is out of engagement with said locking



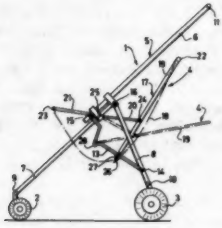
recess, wherein at least one of said first and second surfaces is urged into engagement with said housing by said resilient means whereby when said second surface engages said housing, said resilient means will hold said second surface in engagement with said housing and thereby hold said locking part out of engagement with said locking recess to thereby render said front jaw free to move along the length of said ski, and wherein said operating member is received in said recessed portion in said housing when said first surface engages said housing.

4,681,340

CHILD'S FOLDING PUSHCHAIR

Henri Pasquini, Cholet, France, assignor to Ampafrance, S.A., Boulogne-Billancourt, France

Filed Jul. 29, 1985, Ser. No. 759,732
Claims priority, application France, Aug. 6, 1984, 84 12419
Int. Cl.[4] B62B 7/06
U.S. Cl. 280—642 **10 Claims**



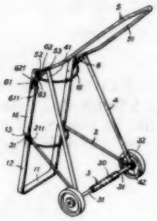
1. A child's folding pushchair, comprising two lateral frame assemblies transversely connected to each other by means of at least one bracing crossbar, each lateral frame assembly having a first element formed of a main supporting arm whose lower front portion supports a second element of said assembly formed by a front strut carrying at least one front wheel or the like, a third element of said assembly formed by a rear strut carrying at least one rear wheel or the like, the first and second elements being slidably coupled to each other and the third element being pivotally attached at its upper end to one of said first and second elements, and a fourth element of said assembly formed by a stiffening link-rod the ends of which are pivotally connected to the third element and to the other one of said first and second elements respectively, and a seat unit carried by each lateral frame assembly, the lateral frame assemblies being foldably collapsible by relative retraction of said first and second elements in sliding relationship and by causing the third element to rotate towards said first and second elements due to the drawing action of said fourth element, wherein the seat unit comprises a frame provided on each lateral side with a seat-back lateral chassis member pivotally supported on one of said third and fourth elements and pivotally connected to an end of a connecting-rod having another end pivotally connected to one of said first and second elements, whereby for folding of the pushchair, when said first and second elements relatively retract in sliding motion and said third element is rotatable towards said first and second elements under the drawing action applied by said fourth element, said seat-back lateral chassis member and said connecting-rod also move to the folded position.

4,681,341

COLLAPSIBLE GOLF CART WITH ONE-STEP FOLDING OPERATION

Winston Lai, P.O. Box 10160, Taipei, Taiwan

Filed Jul. 14, 1986, Ser. No. 885,603
Int. Cl.[4] B62B 1/26
U.S. Cl. 280—646 **5 Claims**



1. A collapsible golf cart comprising: a generally U-shaped supporting frame adapted for receiving and fastening a golf bag thereon, said frame having a base plate, two side arms extending upwardly from the sides of said base plate, an inclined-surface portion extending upwardly and outwardly from the upper end of each said side arm, and an upper arm extending upwardly from the upper end of each said inclined-surface portion;

a generally U-shaped handle having two arms with open ends, each open end being pivotally secured to a respective one of said upper arms by first pin means;

a pair of radial-movement legs, each leg having an upper end with an inclined-surface plate pivotally connected to a respective one of said inclined-surface portions by screw means for permitting sliding engagement of said inclinded-surface plate with said inclined-surface portion and a lower end with an opening extending therethrough;

a pair of actuating links, each link having an upper end pivotally connected by second pin means to a respective arm of said handle at a location adjacent said first pin means and a lower end with an opening extending therethrough;

a wheel supporting shaft including a central sleeve, a pair of telescopic shafts, and a wheel rotatably mounted on an outer portion of each shaft, the inner portion of each shaft, being telescopically received within a respective end of said central sleeve, each said shaft having its outer portion pivotally received within the opening at the lower end of each said radial-movement leg and said actuating link;

whereby when said cart is in a collapsed position, upon the

raising of said handle about a fulcrum of said first pin means, said actuating links are pulled outwardly by said handle for moving the lower ends of said radial-movement legs rearwardly and outwardly while their upper ends pivot about the axis of said screw means, thereby resulting in the extension of each wheel and its respective telescopic shaft in an outwardly transverse direction for increasing the stability of the cart.

4,681,342

WHEEL SUSPENSION

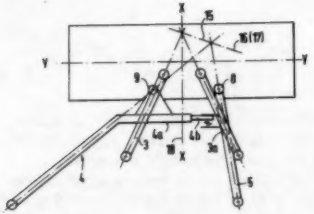
Hans-Jürgen Göerich, Sersheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,358

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514788

Int. Cl.⁴ B60G *3/18*

U.S. Cl. 280—690 **11 Claims**



1. A wheel suspension for a motor vehicle, comprising a double cross-guide member structure including two upper and two lower guide arms, said double cross-guide member structure being pivotally connected at a wheel carrier and forming an elastokinematic axis of rotation with an ideal wheel steering pole which—in relation to the driving direction—is located to the rear of the axis of rotation of the wheel and outside of the track, the wheel being adjustable in case of forces acting on the same, a forwardly disposed lower guide arm of the wheel suspension—in relation to the driving direction—being retained at the wheel carrier in front of the axis of rotation of the wheel within a joint means and being supported at its rearward end on a control bearing support means arranged to the rear of the wheel axis of rotation and yielding in the vehicle transverse direction.

4,681,343

REAR AXLE ASSEMBLY FOR SUSPENSION OF MOTOR VEHICLES

Patrick Gallet, Les Ulis, and Henri Galles, Aulnay sur Mauldre, both of France, assignors to Regie Nationale Des Usines Renault, Boulogne Billancourt, France

Filed Jan. 24, 1986, Ser. No. 821,970

Claims priority, application France, Apr. 19, 1985, 85 05975

Int. Cl.⁴ B60G *11/46, 3/00*

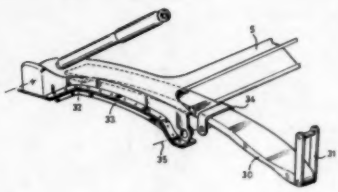
U.S. Cl. 280—699 **4 Claims**

1. A vehicle suspension comprising:

a box section trailing arm having box section surfaces, said arm further including an open end pivoted to a body of said vehicle about a fixed axis, as well as an end opposite said open end and including means for attachment of a road wheel thereto;

a leaf spring having one end connected to said vehicle body by a shackle and having another end fitting through said open end and into said box section of said trailing arm;

a clevis fixed to a mid portion of said leaf spring and pivoted about said axis, said clevis being positioned to rest against a crossmember of said body, whereby said another end of said leaf spring is pressed towards a lower interior surface of said box section; and



pad means positioned between said another end of said leaf spring and said lower surface of said box section.

4,681,344

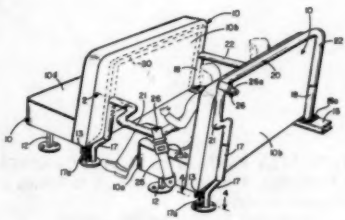
SAFETY HOLD-DOWN BAR SYSTEM

Howard J. Majerus, Rte. 2, Osakis, Minn. 56360

Filed Sep. 27, 1985, Ser. No. 781,041

Int. Cl.⁴ B60R *21/00*

U.S. Cl. 280—751 **4 Claims**



1. A safety hold-down bar system for restraining passengers in combination with a multiple seat bus, said system comprising,

a multiple seat bus having side windows and a central aisle with rows of seats on both sides of the aisle and a driver's seat in the front of the bus with a rear view mirror positioned to permit the driver view the inner aisle ends of the seats,

a pair of upstanding support struts mounted in fixed relation adjacent the back of each seat disposed forwardly of the seat in which the passengers are to be restrained,

a continuous, substantially U-shaped restraining bar unit extending substantially the full width of the seat from the window to the aisle end thereof and pivotally mounted on said struts for swinging movement from upstanding, substantially vertical, inoperative position downwardly into restraining operative position in engagement with the lap of each seated passenger, and

releasable means located at the aisle end of the bar unit within view from the driver's seat for anchoring the U-shaped bar in downward restraining position.

4,681,345

PASSIVE AUTOMOBILE SEAT BELT REMINDING DEVICE

Willson C. Swartout, 31 Phoenix Ave., Newark, Del. 19711

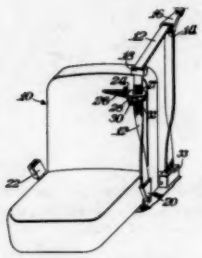
Filed Jul. 23, 1986, Ser. No. 888,477

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 280—801 **1 Claim**

1. A device which passively reminds persons seated in an automotive vehicle seat to fasten his or her seat belt, the device comprising seat belt clip means for an otherwise conventional seat belt employed in conjunction with said seat, the clip means having a projection extending therefrom such that, when the

seat belt is disengaged, said clip means is positioned so that said projection extends into the space normally occupied by a user of said seat, and when the seat belt is properly engaged, said clip means is positioned so that the projection is stowed unob-



trusively out of the way of the user and vehicle controls, thereby causing discomfort to said user of said seat as a result of said projection prodding said user until the user properly engages the seat belt.

4,681,346

AUTOMATICALLY FASTENING SEATBELT ASSEMBLY

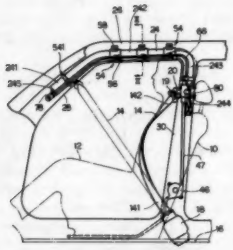
Noritada Yoshitsugu, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 3, 1985, Ser. No. 804,081

Claims priority, application Japan, Dec. 12, 1984, 59-188253[U]; Jan. 16, 1985, 60-3860[U]

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—804 **31 Claims**



1. A seatbelt assembly for automatically fastening a restraining webbing around an occupant in a vehicle, comprising:

a guide rail having a longitudinal guide groove formed therein;

a slider displaceable along said longitudinal guide groove;

an anchor plate pivotally mounted to said slider, the restraining webbing being attached to said anchor plate;

adjusting means for adjusting a normal position of said anchor plate in relation to said slider, thereby permitting adjustment of the position of the restraining webbing relative to the size of the occupant; and

rotation preventing means for preventing said anchor plate from rotating beyond a predetermined angle relative to said slider.

4,681,347

AUTOMATIC SEATBELT APPARATUS

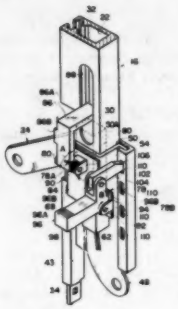
Keiichi Tamura; Yuji Nishimura, and Takashi Kawaharazaki, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Sep. 3, 1986, Ser. No. 903,246

Claims priority, application Japan, Sep. 4, 1985, 60-135251[U]

Int. Cl.[4] B60R *22/06*

U.S. Cl. 280—804 **21 Claims**



1. An automatic seatbelt apparatus which is capable of automatically applying, or canceling the application of, a webbing around an occupant of a vehicle, comprising:

(a) a guide rail disposed in the vicinity of the roof of a vehicle such as to extend in the longitudinal direction of the vehicle;

(b) a slider by which one end of said webbing is retained and which is capable of moving along said guide rail;

(c) a flexible elongated member for moving said slider along the guide rail toward the front or rear of the vehicle between a webbing-application position and a webbing application-canceling position;

(d) a driving means for driving said flexible elongated member by imparting a driving force to the same such as to move said slider;

(e) a flexible guide member disposed between said driving means and said guide rail and accommodating a part of said flexible elongated member;

(f) a detecting means which moves in response to the bending of said guide member and is adapted to stop said driving means when said slider reaches said webbing-application position; and

(g) a lock means for selectively securing said detecting means at a plurality of predetermined positions in response to the bending of said guide member,

whereby said webbing-application position can be altered even if the occupant is in a webbing-applied state.

4,681,348

FINANCIAL DOCUMENT PROTECTION

William H. Mowry, Jr., Ionia, N.Y., assignor to The Standard Register Co., Dayton, Ohio

Filed May 31, 1985, Ser. No. 739,848

Int. Cl.[4] B42D *15/00*; G09F *3/03*

U.S. Cl. 283—58 **6 Claims**

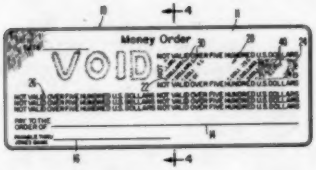
1. A financial document protected against alteration, comprising:

a substrate,

a first area, extending across a portion of the surface of said substrate, for indicia specifying the amount of said financial document, said first area having at least one line of indicia indicating a maximum amount, and

a second area on said substrate for indicia specifying the amount of said financial document, said second area hav-

ing associated therewith indicia specifying the maximum amount of said financial document and further including a



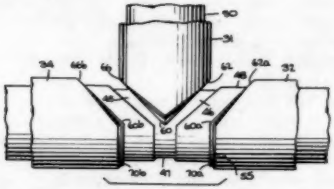
plurality of diagonal variable spaced lines of indicia which indicate currency.

4,681,349

PLASTIC LINED WELDED METAL COMPONENT AND METHOD OF MANUFACTURE

Irving D. Press, West Orange, and John Krieg, Morristown, both of N.J., assignors to Unidynamics Corporation, New York, N.Y.

Filed Jun. 3, 1986, Ser. No. 870,025
Int. Cl.[4] F16L *13/02*
U.S. Cl. 285—55 **25 Claims**



1. A method for fabricating a plastic-lined weldment in which metal housing members are assembled about a preformed plastic liner and the joints between the housing members are welded, comprising in combination the steps of selecting a one piece preformed plastic liner having grooves in its outer surface which grooves are located for underlying the joints to be welded coextensive with said joints, assembling about said selected liner said housing members with the joints located over said grooves, at least one of said housing members having path-defining surfaces for establishing communication between said grooves and the surrounding atmosphere when said housing members are assembled about said liner, and thereafter welding said joints.

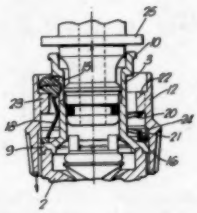
4,681,350

QUICK COUPLING CONNECTION FOR HOSES

Giorgio Gaita, Correggio Emilia, Italy, assignor to G.F. S.r.l., Correggio Emilia, Italy

Filed Dec. 11, 1985, Ser. No. 807,698
Claims priority, application Italy, Aug. 2, 1985, 34836/85[U]
Int. Cl.[4] F16L *37/00*
U.S. Cl. 285—315 **1 Claim**

1. In a quick coupling connection of the type comprising a male element with an outer engagement groove; a receiving portion in the form of a female element to axially receive the male element and provided with two diametrically opposing apertures; an axially slidable collar which embraces the receiving portion of the female element; and interposed between said female element and collar, two teeth, which are inserted into the apertures of the female teeth radially outwardly into engagement with an inner surface of the collar, and wherein the elastic means comprise, two identical annular elements interposed between said strips and in the form of an ellipse with its major axis orthogonal to the axis of the coupling, said annular elements each curving about its major axis, said strips and annular elements being connected to a common circular base ring resting on a widened part of the receiving portion, respective projections on the inner surface of the collar against which said elliptical elastic elements press, and proturberances on said



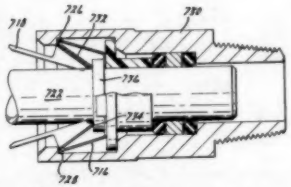
collar for retaining the teeth in their locking position, said collar having beyond said proturberances, widened spaces into which the teeth are inserted by the strips when the teeth are released from the projections.

4,681,351

SWIVELABLE QUICK CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Sep. 16, 1985, Ser. No. 776,644
Int. Cl.[4] F16L *37/12*
U.S. Cl. 285—319 **12 Claims**



1. A retainer element for securing a conduit in a connector, the retainer element comprising:

a body, said body having a collar means, said collar having an aperture therethrough for passage of said conduit, at least two deflectable legs projecting from said body, and clasp means secured to said legs for securing said conduit in said retainer element and in said connector, said clasp means includes a latch, said latch having a catch for securing said clasp on said leg of said body.

4,681,352

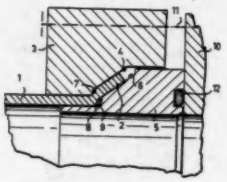
JOINT FOR A PIPE PROVIDED WITH A FLARED END

Göran Sundholm, Kauniainen, Finland, assignor to GS-Hydro Oy, Vantaa, Finland

PCT No. PCT/FI85/00031, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO86/00383, PCT Pub. Date Jan. 16, 1986
PCT Filed Mar. 29, 1985, Ser. No. 843,691
Claims priority, application Finland, Jun. 18, 1984, 842455
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334.1 **6 Claims**

1. A joint for a pipe having a flared end comprising a tightening flange provided with an internal supporting surface for making contact with an outside of the flare, an insert piece having an external supporting surface for making contact with the inside of said flare, said internal supporting surface of the

tightening flange having in the radially inner end thereof a substantially rounded shoulder for initiating contact with the outside of the flare at least in the transition area between said flare and the axial portion of the pipe when the tightening



flange is tightened, the external supporting surface of the insert piece is provided in the radially inner end thereof with a notch for receiving the pipe material deformed by said shoulder of the tightening flange, a sealing ring being fitted in said notch of the insert piece.

4,681,353

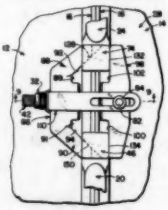
V-COUPLING FOR INSTALLATION IN NARROW ANNULAR SPACES

Horace P. Halling, Laurel, Md., assignor to Pressure Science Incorporated, Beltsville, Md.

Filed Jul. 17, 1984, Ser. No. 631,795

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—411 **11 Claims**



1. A device for coupling a first peripheral flange on a first annular member and a second peripheral flange on a second annular member, these flanges being coaxial, the combination comprising:

at least first and second arcuate coupling members, each arcuate coupling member having an inner surface including a recess for receiving portions of the first and second peripheral flanges therein, and having first and second ends;

pivot means, coupled to the first ends of said first and second arcuate coupling members, for pivotally coupling said first ends together; and

tightening means, coupled to the second ends of said first and second arcuate coupling members, for coupling said second ends together and for radially inwardly moving said first and second arcuate coupling members into intimate contact with said first and second flanges,

said tightening means comprising:

a rotatable member, said rotatable member being oriented in an axial direction parallel to the axis of the coupled coaxial flanges,

first and second tightening members engaging said first and second arcuate coupling members,

connecting means for connecting said first tightening member to said second tightening member, and

retaining means, coupled to said first and second tightening members, for retaining said first tightening member in proximity to said second tightening member,

said retaining means including a U-shaped member engaging said first tightening member and a pin coupled to said second tightening member and to said U-shaped member.

4,681,354

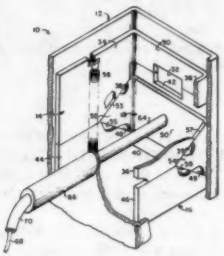
WINDOW GRILL LATCH

David R. Warwick, 51 Silverwood Dr., Lafayette, Calif. 94549

Filed Nov. 25, 1986, Ser. No. 935,529

Int. Cl.[4] E05C *1/12*

U.S. Cl. 292—37 **5 Claims**



1. A grill latch comprising

means defining a latch guide housing having means defining a bolt receiving opening therein,

an upper latch member disposed in said latch guide housing comprising

an upper bolt receiving face plate disposed proximate said bolt receiving opening in said latch guide housing,

a pair of upper side panels attached to each side of said upper bolt receiving face plate and adapted to slidably engage opposite sides of said latch guide housing,

a lower latch member disposed in said latch guide housing comprising

a lower bolt receiving face plate disposed proximate said bolt receiving opening in said latch guide housing,

a pair of lower side panels attached to each side of said lower bolt receiving face plate and adapted to slidably engage opposite sides of said latch guide housing,

means for moving said upper and lower latch members toward and away from each other comprising

means, slidably engaging said upper side members proximate the bottom thereof and slidably engaging said lower side members proximate the top thereof, for moving said upper and lower latch members toward and away from each other.

4,681,355

SECURITY SEAL FOR USE WITH STRANDED CABLE

Terrence Brammall, Angola, Ind., and Richard S. Guiler, Newton, N.J., assignors to Trans-Guard Industries, Inc., Angola, Ind.

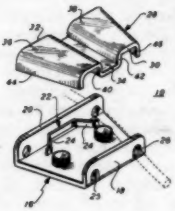
Filed Oct. 22, 1985, Ser. No. 790,061

Int. Cl.[4] B65D *33/34*

U.S. Cl. 292—323 **6 Claims**

4. A security seal housing formed of upper and lower plates which are superimposed and fastened together, said plates being generally trapezoidal in plan shape with top, bottom, and side edges, the top edges being shorter than the bottom edges, one plate having a groove formed therein extending between the top and bottom edges, said groove having side walls and a bottom, the bottom being fastened to the other plate, said plates having cooperating flanges at the top, bottom, and sides which close the space between the edges of the plates, the flanges at the top and bottom each having spaced apertures to

receive a shackle, the side walls of the groove and the flanges at the side edges of the plate forming channels between the



plates that extend between the flanges at the top and bottom and increase in width from the top to the bottom thereof.

4,681,356

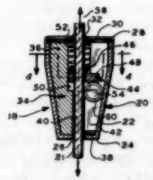
CONICAL CABLE LOCK

Terrence N. Brammall, Angola, Ind., assignor to Trans-Guard Industries, Inc., Angola, Ind.

Continuation of Ser. No. 490,341, May 2, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 772,191

Int. Cl.[4] B65D *33/34*

U.S. Cl. 292—327 **6 Claims**



1. A lock for a line, said lock being of the type that is slidable in a first direction onto said line but locks against motion over the line in the opposite direction, comprising

a lock body having an axial opening with said line receivable therethrough, said body further defining three slots radiating outwardly from said opening, each slot having an outer wall inclined inwardly toward the opening in said first direction;

three disks, one disk in each of said slots, each of said disks having a bevelled outed periphery;

said disks each having threads around the outer periphery;

and means for biasing said disks toward said first direction in said slots.

4,681,357

AUTOMOTIVE DOOR HANDLE CONTAINER

Isamu Uemura, Yokosuka, and Kazumasa Yamamoto, Chofu, both of Japan, assignors to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1984, Ser. No. 677,534

Int. Cl.[4] E05B *5/00*

U.S. Cl. 292—336.3 **1 Claim**

1. A door handle assembly comprising:

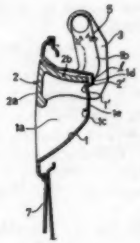
door panel means,

a handle recess defined by said door panel means, said handle recess including an outwardly projecting projection,

a door handle pivotally mounted outside of said handle recess and said door handle being located in said handle recess and mounted on said door panel means for pivotable movement from said handle recess, said handle recess defining an open space for a hand of an operator to reach into said handle recess and pull outwardly on said door handle,

said door handle including a first end flush mounted with an exterior surface of said door panel means and including a second end located opposite to said first end, said second end of said handle extending transverse to said first flush end,

first and second bottom wall portions separated by said projection, said second bottom wall portion extending further inwardly into said handle recess than said first bottom wall portion to define a gap between itself and a



terminal portion of said second end of said handle, said terminal portion being spaced from said outwardly projecting projection and extending into said handle recess substantially the same distance as said first bottom wall portion to thereby prevent the hand of the operator from being positioned between said second end and said door panel means when said door handle is in said handle recess in a position of rest.

4,681,358

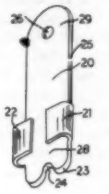
CONTAINER OPENING TECHNOLOGY

Thomas T. Smith, 1731 10th St., S., Fargo, N. Dak. 58103

Filed Oct. 31, 1980, Ser. No. 202,672

Int. Cl.[4] B67B *7/44*

U.S. Cl. 294—15 **11 Claims**



1. A device for opening a non-detachable, component opening system of a container of the type having a scored section at its top and an empaling tab having a fastener for fastening the empaling tab in a fulcrum alignment to the scored section, said device comprising:

(a) a unitary body member having an upper surface, a lower surface, a thin leading end portion, a trailing handle portion, and oppositelv facing side edges, said thin leading end portion being for sliding beneath the empaling tab of the opening system, and said trailing handle portion for grasping by a user of said device, said thin leading end portion further having a centrally disposed indented portion for receiving and abutting the empaling tab fastener, and

(b) a rigid tab restraining means for securely engaging at least a portion of the top surface of an empaling tab during the opening of a container having a non-detachable, component opening system, said restraining means projecting generally upward from said body member upper surface

at generally said oppositely facing side edges and further projecting spacially parallel to at least a portion of the upper surface of said body member, whereby, the placement of said device with said leading end portion placed beneath an empaling tab, with said centrally disposed indented portion of said leading end portion abutting against the empaling tab fastener, and with said tab restraining means positioned above an empaling tab allows a user of said device to grasp and lift said trailing handle portion and, to thereby, easily separate and push downward the scored section of an opening system to gain access to a container.

4,681,359

BELT GRIPPING DEVICE

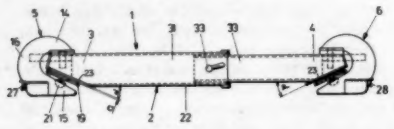
Hermann Stolz, Mühlheim, Fed. Rep. of Germany, assignor to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG., Offenbach, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,903

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 3516161

Int. Cl.[4] B25B *25/00*; B66F *19/00*

U.S. Cl. 294—81.21 **12 Claims**



1. An apparatus for pulling an end of a conveyor belt having a given belt width, longitudinal belt edges, and a central zone between said belt edges, into a desired position, comprising cross bar means extending across said belt width, said cross bar means having at least two bar elements adjustable axially in their position relative to each other for adjusting said cross bar means to a desired length relative to said given belt width, and means for securing said bar elements to each other in an adjusted position, a clamping device (**5**, **6**) for clamping each belt edge outside said central zone, means (**9**) for journalling each clamping device to an outer end of said cross bar means, each clamping device comprising a first clamping element having a clamping surface (**23**) for contacting one belt surface zone along said belt edges, and a second clamping element (**19**) having a further clamping surface (**20**) for contacting an opposite belt surface zone along said belt edges, whereby a contact by said apparatus of said conveyor belt end and of said central belt zone is substantially avoided.

4,681,360

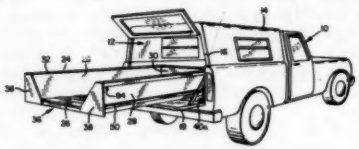
COMBINATION ACCESS BOX AND BED LINER FOR VEHICLES

Richard E. Peters, and Larry J. Parlette, both of 3345 SE. 22nd Ave., Portland, Oreg. 97202

Continuation of Ser. No. 788,473, Oct. 17, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,061

Int. Cl.[4] B60R *5/04*

U.S. Cl. 296—37.6 **3 Claims**



1. In combination,

a vehicle having a covered cargo area with forward and rearward ends and defined by a floor and side walls and a rear opening closed by a closure door,

an access box comprising an open top container having a bottom wall, side walls, and a front wall,

said container having an open rearward end,

triangular corner webs at said open rearward end secured between said side walls and said bottom wall for reinforcing said side walls at said open rearward end,

a pair of laterally spaced, longitudinal support members secured to the floor of said vehicle cargo area,

longitudinal rail means and engaging rollers on said container and support members respectively supporting said box above said floor for longitudinal movement between a forward loaded position a plurality of intermediate positions and a rearward access position,

said rail means and rollers providing self support of said box in said intermediate positions as well as in said rearward access position at a point such that articles in the front thereof can be reached from a point beyond the rear of said vehicle cargo area,

said longitudinal rail means and rollers providing cantilevered and straight line, self-support of said box in said rearward access position and in alignment with its line of travel,

one of said support members having a vertical extension along its length with a top edge and a plurality of latch recesses in said top edge,

a spring pressed, vertically operating latch on said container arranged for engagement with said latch recesses for automatic engagement therewith,

vertical guide means on said container providing stable vertical movement for said latch,

and rotatable manually operable control means operating said latch to allow the latch to automatically engage said stops or to cause said latch to bypass said stops,

a rearwardmost one of said latch recesses holding said container in its rearward access position and a forwardmost one of said latch recesses holding said container in a selected forward loaded position wherein said closure door of the vehicle forms a closure for said open rearward end of said container.

4,681,361

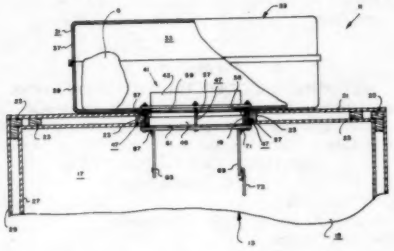
STORAGE POD

Sue H. Jolley, and William H. Jolley, both of 106 Prospect Dr., Water Valley, Miss. 38965

Filed Jul. 17, 1986, Ser. No. 886,422

Int. Cl.[4] B60R *5/00*

U.S. Cl. 296—37.7 **9 Claims**



1. A storage pod for a vehicle said vehicle having a body with a substantially hollow interior and having an access opening through said body into said interior, said pod comprising:

(a) a storage compartment having a body with a substantially hollow interior and having an access opening through said body thereof into said interior thereof; and

(b) access/attachment means for attaching said body of said storage compartment to said body of said vehicle with

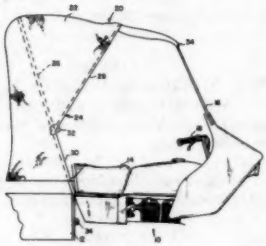
said access opening through said body of said storage compartment substantially aligned with said access opening through said body of said vehicle for allowing access into said interior of said body of said storage compartment from said interior of said body of said vehicle; said access-/attachment means including a first access/attachment member located within said interior of said body of said storage compartment, a second access/attachment member located within said interior of said body of said vehicle, and securing means for securing said first and second access/attachment members to one another in such a manner so as to substantially align said access opening through said body of said storage compartment with said access opening through said body of said vehicle; said first access/attachment member including a sleeve member for extending into said access opening through said body of said storage compartment, said second access/attachment member including a sleeve member for extending into said access opening through said body of said vehicle.

4,681,362

TOP FOR MOTORCYCLES AND SNOWMOBILES

Jimmie Taylor, 7002 Industrial Ave., Flint, Mich. 48505

Filed Mar. 10, 1986, Ser. No. 837,834
Int. Cl.[4] B60J 7/00
U.S. Cl. 296—78.1 **4 Claims**



1. A removable top for vehicles including a body and a windshield, comprising;

a first loop connectable at its bottom to the vehicle body and a second loop connected to said first loop and inclined in a forward direction said loops comprising tubular metal members; and a canopy further connected over said loops and having its forward end connected to said windshield of said vehicle, said canopy having in its rear end symmetrically arranged vented openings including a pair of upper laterally spaced vented openings and a lower vented opening.

4,681,363

VISOR SYSTEM

Ronald L. Hemmeke, and Scott A. Spykerman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

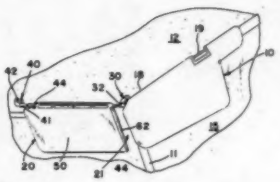
Filed Nov. 7, 1985, Ser. No. 796,090
Int. Cl.[4] B60J 3/02
U.S. Cl. 296—97 G **13 Claims**

1. A visor system for selectively providing simultaneous sun blocking protection for the windshield and a side window of a vehicle comprising:

a pair of brackets adapted to be mounted in spaced relationship above a vehicle window;

a first visor pivotally coupled to one of said brackets for movement of said visor in a generally horizontal direction to selectively provide sun blocking for either the adjacent side window or the windshield; and

a second visor substantially shorter than said first visor; and means for mounting said second visor between said brackets with the end edge of said second visor nearest said side window being spaced inwardly from said one bracket for permitting said second visor to be pivoted between a raised, stored position adjacent the vehicle roof and a lowered, use position adjacent the vehicle window, said second visor including housing means and an extension panel located adjacent said edge and slidably mounted to said housing means for sliding movement toward said side



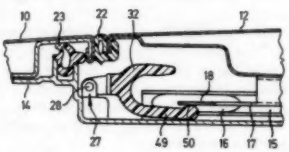
window along an axis parallel to the longitudinal axis of said second visor between a stored position at least partially within said housing and use positions extended from said housing, whereby said second visor before the extension panel is extended can be pivoted downwardly after which said extension panel can be extended at least as long as said first visor.

4,681,364

SLIDING ROOF FOR VEHICLES HAVING A WIND DEFLECTOR

Horst Bienert, Gauting, and Georg Kohlpaintner, Martinsried, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Apr. 28, 1986, Ser. No. 856,362
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515066
Int. Cl.[4] B60J 7/22
U.S. Cl. 296—217 **12 Claims**



1. Sliding roof for vehicles of the type having a cover which, in a closed position, covers a roof opening of a fixed roof surface and is mounted for rearward sliding movement, and also having a wind deflector that is pivotably mounted, in the area of a front edge of the roof opening, so as to be upwardly tiltable into an extended position by rearward sliding of the cover, and downwardly tiltable, from said extended position, by an actuating device into a retracted position when the cover is slid forward, wherein, in addition to elements of the actuating device, two locking elements are bilaterally attached to the wind deflector in a manner preventing pivotal movement therebetween and against which, in the foremost sliding position of the cover, there is contact by respective hold down clamping elements which are mounted so as to be displaceable together with the cover.

4,681,365

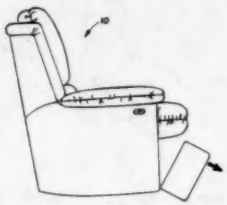
MULTIDIRECTIONALLY RESILIENTLY RELEASING OTTOMAN FOR MOTION CHAIR

James J. Pine, Tupelo, Miss., assignor to Action Industries, Inc., Tupelo, Miss.

Continuation-in-part of Ser. No. 857,323, Apr. 30, 1986. This application Jun. 18, 1986, Ser. No. 875,481

Int. Cl.[4] A47C 1/02

U.S. Cl. 297—85 16 Claims



1. Apparatus for providing a motion chair with a resiliently releasing capability for a transversally elongated ottoman which is movable between a raised, thrust position in which the ottoman is generally horizontal, and a retracted, stowed position in which the ottoman normally is generally vertical, for which purpose the ottoman is mounted to a seat frame of the motion chair by a mechanism which includes left and right side linkages, each of which, towards its front, has a set of pantograph links including an upper pantograph link having a front end and a lower pantograph link having a front end,

said apparatus comprising:

a generally vertical plane front end link for each side linkage, each of these front end links being elongated in a direction which is adapted to be generally vertically-oriented when the ottoman is in its retracted, stowed position;

said front end links, with respect to such vertical orientation, each having:

an upper transversally extending horizontal axis pivot means for pivotally connecting with said front end of said upper pantograph link of the respective said side linkage,

a lower transversally extending horizontal axis pivot means for pivotally connecting with said front end of said lower pantograph link of the respective said side linkage, and

adjacent but displaced from said lower transversally extending horizontal axis pivot means, a further transversally extending horizontal axis pivot means;

a pair of ottoman mounting brackets, each having a vertical plane flange means, each of these brackets being elongated in a direction which is adapted to be generally vertically oriented when the ottoman is in its retracted, stowed position;

securement means on said ottoman mounting brackets adapted for mounting said ottoman thereto;

each said vertical plane flange means, effectively below said securement means, relative to said vertical direction of orientation of said vertical plane flange means, being pivotally connected to a respective said front end link by a respective said further transversally extending horizontal axis pivot means; and

resilient means tending to maintain each said vertical plane flange means aligned with the respective said front end link as to said direction of elongation of each, but permitting the respective vertical plane flange means to pivot forwardly about the respective said further transversally extending horizontal axis pivot means against a restoration force provided by said resilient means, so that the ottoman may pivot forward to accomodate and release an obstruction to its being brought to its retracted, stowed position, then be automatically pivoted rearward by the resilient means when the obstruction has been cleared;

each said vertical plane flange means comprising two interpivoted elements, namely a laterally outer vertical plane flange element and an intermediate link element which are pivotally joined to one another at an additional transverse horizontal axis pivot joint located near upper ends of these two elements;

each said resilient means being mounted between an anchoring means effectively based on the respective said laterally outer vertical plane flange element near the upper end of such element and an anchoring means provided said intermediate link near a lower end of such element;

each said further transversally extending horizontal axis pivot means pivotally connecting the respective said intermediate link element near said lower end thereof to a respective said front end link for pivotally connecting each said vertical plane flange means, effectively below said securement means, to a respective front end link, whereby the respective laterally outer vertical plane flange elements are permitted to pivot forwardly about the respective said additional transversally extending horizontal axis pivot means against a restoration force provided by said resilient means, so that the ottoman may pivot forward to accomodate and release an obstruction to its being brought to its retracted, stowed position, then be automatically pivoted rearward by the resilient means when the obstruction has been cleared.

4,681,366

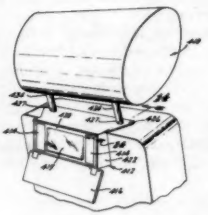
VANITY MIRROR OR VEHICLE ACCESSORY ASSEMBLY AND MOUNTING APPARATUS THEREFOR

Mark Lobanoff, Troy, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.

Continuation-in-part of Ser. No. 746,676, Jun. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,280, Jul. 2, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 795,520

Int. Cl.[4] A47C 7/62

U.S. Cl. 297—191 44 Claims



1. In a seat for a vehicle, including a seat having front and rear sides, a head restraint, and head restraint mounting means for interconnecting said head restraint with said seat, the improvement comprising: a mirror housing including a mirror; and a mirror housing mounting means coupled with said mirror housing for mounting said mirror housing on the rear of said seat assembly, said mirror housing mounting means including means for coupling with, and being retained by, the head restraint mounting means in order to retain and support said mirror housing on the rear side of the seat the head restraint mounting means including at least one mounting arm supportingly interconnecting the head restraint with the seat, said mirror housing mounting means including at least one opening extending therethrough for receiving said mounting arm extending therethrough in order to connect said mirror housing with said mounting arm and to retain said mirror housing on the seat assembly.

4,681,367

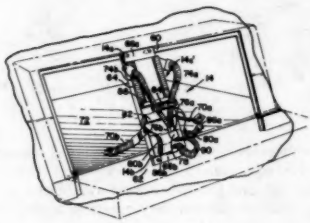
AUXILIARY SEAT

Richard E. Timmers, 1210 E. County Rd. B, Maplewood, Minn. 55109

Continuation-in-part of Ser. No. 506,522, Jun. 21, 1983. This application Aug. 21, 1985, Ser. No. 768,040

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—232 1 Claim



1. A safety seat suitable for permanent mounting as an integral part of an automobile bench seat, the bench seat having a bench seat frame, the automobile having a trunk floor, comprising:

(a) a main frame, the main frame comprising: (1) a central body portion, the central body portion being longitudinally ribbed; (2) a perforated top flange, the top flange being integrally formed with the central body portion; (3) a perforated bottom flange, the bottom flange being integrally formed with the central body portion at an end opposite the top flange;

(b) a first set of mounting bolts, the mounting bolts passing sequentially through the perforations of the top flange and mating perforations within the bench seat frame, the bolts thereafter being secured by nuts;

(c) a second set of mounting bolts, the mounting bolts passing sequentially through the perforations of the bottom flange and mating perforations within the bench seat frame, the bolts thereafter being secured by nuts;

(d) a seat base;

(e) a seat back having a top end, a bottom end, a left side, a right side, a front side and a back side, the bottom end of the seat back being connected to the back end of the seat base such that the seat back and the seat base define an approximately L-shaped form, the seat back being adjacent and parallel to the main frame and connected thereto;

(f) an armrest having a back portion and an inner side, the armrest being connected at the inner side of the back portion to one of the left and right sides of the seat back;

(g) a seat belt having a first and a second portion, each portion having a first and a second end, the first and second portions being securely fastened at the second ends to the main frame, and the seat belt further comprising means to releasably fasten the first ends of the first and second portions together; and

(h) a pair of straps, each strap being fastened to the central body portion at one end, the strap being fastened to the trunk floor at an opposite end, the strap thereby preventing twisting when the bench seat frame is subjected to side loads.

4,681,368

CHILD RESTRAINT BASSINET

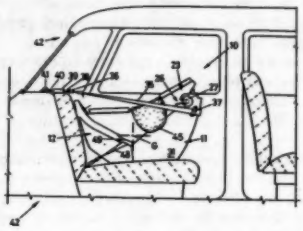
Robert B. Heath, and Colin M. Nagel, both of Lonsdale, Australia, assignors to Safe-N-Sound Pty. Limited, South Australia, Australia

Filed Oct. 16, 1985, Ser. No. 788,069

Claims priority, application Australia, Oct. 19, 1984, PG7727

Int. Cl.[4] A47D *7/04;* B60R *21/10*

U.S. Cl. 297—250 10 Claims



1. A child restraint bassinet assembly comprising a support base having a rear end for abutting a vehicle seat back and a forward end facing in the direction of motion of the vehicle, a bassinet, hinge means between the bassinet and the support base, an inertia responsive trigger latch engageable between the base and bassinet which normally inhibits swivelling movement of the bassinet, but, upon actuation, releases the bassinet for downward hinging movement with respect to the base, and a finger latch cooperating with the base and bassinet to either retain the bassinet within the base or release it from the base,

a tether strap assembly which includes a base strap, means retaining the base strap to an upper portion of the forward end of the base, and anchor means for securing the base strap to a vehicle at a point above the rear end of the base and thereby retaining the bassinet assembly in the vehicle, with its centre of gravity 'G' wholly below the base strap, the anchor means comprising an anchor stud for securing to the vehicle above the rear end of the base, an anchor strap secured to the base strap, and an anchor member on the anchor strap for securing the anchor strap to the anchor stud.

4,681,369

RECLINABLE VEHICLE SEATS

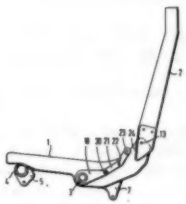
Leslie J. Simpson, Amersham, England, assignor to Flight Equipment and Engineering Limited, Buckinghamshire, England

Filed Dec. 10, 1985, Ser. No. 807,475

Claims priority, application United Kingdom, Dec. 19, 1984, 8432094

Int. Cl.[4] A47C *1/032*

U.S. Cl. 297—316 6 Claims



1. A reclinable seat for use in a vehicle comprising a bottom part having front and rear edges,

a support means, said support means defining an axis of rotation for said bottom part,

a back support part,

means providing a pivotal connection between the back support part and the bottom part adjacent to the rear edge thereof enabling the back support part to be tilted rearwardly from its normal position relative to the bottom part,

mounting means on the bottom part for mounting said bottom part on said support means so as to be rotatable about said axis between a normal, substantially horizontal position and reclining positions wherein it slopes downwardly from its front edge towards its rear edge,

first locating means connected between the bottom part and the support means for determining the degree to which said bottom part is rotated about said support means and for defining a maximum reclining position of said bottom part,

second locating means connected between the back support part and the bottom part for determining the degree to which said back support part is pivoted about said pivotal connection and for defining a maximum rearward tilted position of the back support part relative to the bottom part,

first control means for controlling the operation of said first locating means,

second control means for controlling the operation of said second locating means,

operating means accessible to an occupant of the seat for operating said first and second control means, and

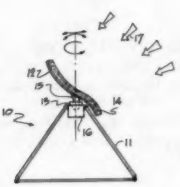
limiting means for limiting the rearward tilting of the back support part when the bottom part is in a reclining position, the limiting means being influenced by the positioning of the bottom part about said axis so as to reduce the permitted maximum rearward tilt of the back support part relative to the bottom part progressively with increasing recline of the bottom part.

4,681,370

ADJUSTABLE HEADREST FOR SUNBATHERS

David W. Vancil, 21031 Parthenia St., Canoga Park, Calif. 91304

Filed Feb. 19, 1987, Ser. No. 16,630
Int. Cl.[4] A47C 7/36
U.S. Cl. 297—405 **1 Claim**



1. A sunbather's headrest comprising:

a base;

a platform for supporting the head of a user;

means carried on said base for movably mounting said platform on said base;

said base includes a broad lower portion and an apex upper portion;

said mounting means secured to said apex upper portion;

said mounting means includes a block fixed to said apex upper portion having an enlarged hole therein;

said platform having a post carried on its underside having an enlarged terminating end adapted to be insertably received into said block hole;

retaining means carried on said block for detachably connecting with said base;

said base comprising a pair of triangular end pieces joined at their apex upper portions by said mounting block; and

said lower portions joined together by detachable brace members.

4,681,371

AUXILIARY DUMPING APPARATUS FOR VEHICLES

Daniel F. Leonard, 612 J Ave., National City, Calif. 92050

Filed Aug. 16, 1985, Ser. No. 766,141
Int. Cl.[4] B60P 1/64
U.S. Cl. 298—1 A **7 Claims**

1. In combination with the bed of a pick-up, trailer or the like which is flanked by lateral walls terminated at their rear ends by a pair of tail-gate jamb elements forming two vertical post-mounting channels, an auxiliary dumping apparatus comprising:

a framework consisting essentially of a pair of longitudinal tracks laid against said bed, a plurality of cross-members placed and dimensioned to keep said tracks in a parallel and spaced-apart relationship, one of said cross-members comprising one arm orthogonally and coplanarly located with respect to the longitudinal tracks along the rear edge of the bed between said jamb elements, a pair of upright members extending from the respective ends of said orthogonal arm alongside and commensurate with said jamb members, a pair of L-shaped fingers respectively secured to the upper ends of said upright members and shaped and dimensioned for engagement into the two post-mounting channels, and a pair of extensions at the respective ends of said orthogonal arm, said extensions projecting into the corners formed by the inner sides of said jamb elements and said lateral walls;

a tiltable bin slidingly mounted on said tracks;

means for locking said bin over the bed;

means for moving the bin longitudinally along said tracks until the center of gravity of the bin is off said bed; and

pivoting means transversally mounted at the rear end of said tracks for tilting the bin beyond the back end of the bed.

4,681,372

DEEP SEA MINING APPARATUS

William L. McClure, 204 40th St., Virginia Beach, Va. 23451

Filed Feb. 11, 1986, Ser. No. 828,265
Int. Cl.[4] E02F 3/88, 7/00
U.S. Cl. 299—8 **16 Claims**

1. Undersea mining apparatus for recovering particulate matter on the ocean floor, said apparatus comprising:

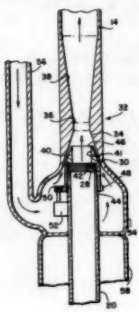
(a) conduit means for conveying particulate material in the form of nodules from the sea floor to a surface vessel, said conduit means having an inlet end adapted to be positioned adjacent the ocean floor and an outlet end spaced from said inlet end and defining a discharge opening to discharge collected nodules into a surface vessel;

(b) pump means for providing a source of water under pressure;

(c) collecting means connected to said inlet end of said conduit means for collecting nodules and for conveying collected nodules to said conduit means;

(d) lifting means in communication with said pump means and connected to said conduit means for providing a lifting jet of pressurized water to cause said nodules to travel through said conduit means, said lifting means including a submerged lifting chamber surrounding said conduit at a desired height of said conduit means above

the sea floor and in communication with said pump means, said conduit means including a lift pipe extending from a point adjacent the ocean floor to said lifting chamber and a dredge pipe extending from said lifting chamber to a surface vessel, said lift pipe communicating with said lifting chamber and having an inlet opening adjacent the ocean floor and extending from the ocean floor and connected to said collecting means, said lift pipe having a parallel wall cylindrical outlet extending within said lifting chamber and efined by a first diameter substantially equal to the lift pipe diameter to define a substantially continuous cylindrical flow passage, said dredge pipe having an inlet within said lifting chamber and adjacent said lifting pipe outlet, said dredge pipe having an outlet positioned to discharge collected material into a surface vessel, said dredge pipe having a venturi including a converging section, a throat section defined by a second diameter smaller than said first diameter and a diverging section, each in axial alignment to provide an axially-symmetric converging-diverging venturi, said lift pipe opening extending into said converging section of said venturi



and defining therewith an annulus area therebetween, said annulus area communicating with said lifting chamber to permit pressurized water to pass through said annulus area and into said venturi to provide a pumping effect to lift the nodules through said conduit means to a surface vessel, said lift pipe outlet and said dredge pipe inlet being movable relative to each other to permit varying said annulus area to achieve a desired lifting effect, and moving means for moving one of said lift pipe outlet and said venturi relative to the other for varying said annulus area, whrein said lift pipe outlet is defined by an axially movable collar that is movable into and out of the converging section of the venturi to vary the annulus area, said collar having an internal thread formed on an inner surface thereof and engageable with an external thread formed on an outer surface of said lift pipe, said collar including an external ring gear formed on an outer surface thereof, and said moving means including a drive means and a drive gear rotatably driven by said drive means, said drive gear engageable with said ring gear to rotate said collar to move it axially toward and away from said venturi.

4,681,373

WHEEL SLIP CONTROL SYSTEM

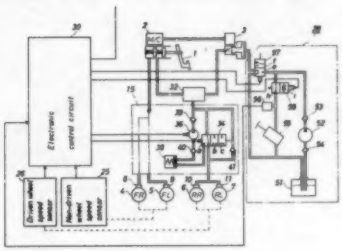
Yoshihisa Nomura; Masakazu Ishikawa, both of Toyota; Akira Shirai, Toyoake; Takahiro Nogami, Toyota; Kazumasa Nakamura, and Kaoru Ohashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1985, Ser. No. 775,005

Claims priority, application Japan, Sep. 21, 1984, 59-199216; May 8, 1985, 60-68438[U]

Int. Cl.[4] B60T *8/08*

U.S. Cl. 303—106 **9 Claims**



1. A wheel slip control system comprising:

brake slip detection means for providing brake slip signals representative of a slip condition of a driven wheel during braking of a vehicle;

acceleration slip detection means for providing acceleration slip signals representative of a slip condition of said driven wheel during acceleration of said vehicle;

a first pressure source for producing a first pressure;

a second pressure source for producing a second pressure;

pressure control means responsive to said acceleration of said vehicle for controlling said seocnd pressure of said second pressure source;

pressure source selection means for receiving said first and second pressures and for outputting selectively one of said first and second pressures, depending upon a measured differential therebetween;

control means responsive to said brake slip signals and said acceleration slip signals for providing anti-skid control signals and traction control signals; and

hydraulic actuator means for receiving said selectively outputted first and second pressures from said pressure source selection means for use as a hydraulic braking pressure, and for responding to said anti-skid control signals and said traction control signals to control a speed of said driven wheel within a predetermined range, thereby preventing said driven wheel from slipping.

4,681,374

WHEEL SLIP CONTROL SYSTEM

Kazumasa Nakamura, Okazaki; Ikuya Kobayashi; Takahiro Nogami, both of Toyota; Akira Shirai, Toyoake; Kaoru Ohashi, Okazaki, and Yoshihisa Nomura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 23, 1985, Ser. No. 790,453

Claims priority, application Japan, Oct. 30, 1984, 59-228537

Int. Cl.[4] B60T *3/08*

U.S. Cl. 303—106 **9 Claims**

1. A wheel slip control system for a vehicle comprising:

pressure source selection means, responsive to a first pressure of a first pressure source and a second pressure of a second pressure source, for measuring a difference between said first and second pressures, and for selecting one of said first and second pressure sources in response to said measured pressure difference;

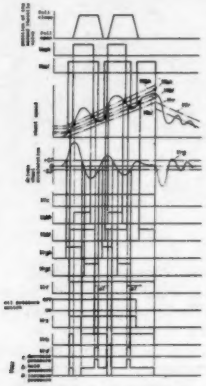
brake slip detection means for sensing a state of slippage of a wheel during a braking operation of the vehicle, and for

providing a brake slip signal representative of the state of slipping;

acceleration slip detection means for further sensing said state slipping of said wheel during an accelerating operation of the vehicle, and for providing an acceleration slip signal representative of said state of slipping;

first and second throttle valves, said first throttle valve connected to an acceleration increasing structure, and said first and second throttle valves located in an air intake path;

control means, responsive to said brake slip signal, for providing a first adjustment signal responsive to said acceleration slip signal for providing said first adjustment signal to



cause the driven wheel speed to be within a first predetermined range, and responsive to said acceleration slip signal for providing a second adjustment signal to a driving means for driving said second throttle valve to cause the driven wheel speed to be within a second predetermined range; and

slip control means connected to said pressure source selection means responsive to said first adjustment signal from said control means for adjusting the pressure from said pressure source selection means, and responsive to said first adjustment signal from said control means for adjusting the second pressure to said pressure source selection means, thereby suppressing a slippage of wheels.

4,681,375

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to Alfred Teves, Frankfurt, Fed. Rep. of Germany

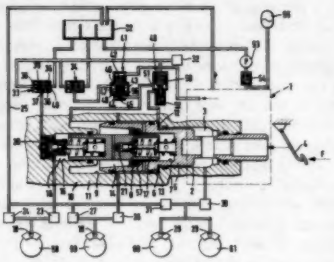
Filed Apr. 11, 1985, Ser. No. 722,719

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413626

Int. Cl.[4] B60T *8/02, 13/14*

U.S. Cl. 303—114 **13 Claims**

1. A hydraulic brake system for automotive vehicles which is provided with a hydraulic power booster having a pressure chamber (3) therein and with a master cylinder operable by the power booster, the booster piston being designed as stepped piston with a pedal-close portion of smaller diameter and with a pedal-remote portion of larger diameter, wherein, together with a housing, the annular surface of the booster piston at the piston step encloses an annular space of variable volume, wherein the annular space is communicating with an unpressurized supply reservoir, which communication can be interrupted, wherein in a pedal-remote pocket bore of the booster piston a master cylinder piston is guided in a sealed manner which confines a working chamber, and wherein an annular chamber confined by the pedal-remote annular surface of the booster piston is pressurizable by the pressure of an auxiliary pressure source, a hydraulic communication being establishable between the annular chamber and the working chamber by way of a non-return valve which opens towards the working chamber, wherein a double-seat valve (41) is arranged



between the annular chamber (14) and the unpressurized supply reservoir (22), said double-seat valve (41) temporarily adopting a closed position at the beginning of the braking operation.

4,681,376

APPARATUS FOR TENSIONING A TRACK CHAIN OF A TRACKLAYING VEHICLE

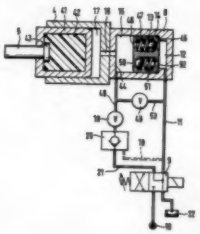
Peter Riml, Mieming, Austria, assignor to Liebherr-Werk Telfs Ges m.b.H., Telfs, Austria

Filed Mar. 5, 1986, Ser. No. 836,384

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507805

Int. Cl.[4] B62D *55/30*

U.S. Cl. 305—10 **10 Claims**



1. Apparatus for tensioning a track chain of a tracklaying vehicle such as a bulldozer, crawler loader, or excavator, said apparatus comprising: a tracklaying undercarriage including a frame and a track chain carried on said frame; drive chain sprocket means rotatably carried on said frame for driving said chain; reversing chain sprocket means with which said track chain is engaged; a hydraulic cylinder for biasing said reversing chain sprocket, which is rotatably mounted in a bearing that is displaceable in a vertical center plane that passes through the track chain, and hydraulic cylinder biasing said reversing chain sprocket to selectively tension and release the tension in the track chain and including a first cylinder chamber and a second cylinder chamber in fluid communication with said first cylinder chamber, a floating piston slidably received in said second cylinder chamber and including a check valve for connecting two parts of said second chamber which are disposed on opposite sides of the piston and for preventing backflow from said first cylinder chamber, the piston being displaceable in said second cylinder chamber between forward and rear stop means at respective ends thereof to an extent which corresponds to a volume of hydrau-

lic liquid which is to be displaced in order to relax a previously tensioned chain to an optimum chain tension, said second cylinder chamber connected adjacent to the rear stop means to a supply conduit and adjacent the front stop means to a return conduit for returning fluid under a pressure corresponding to the pressure applied to tension the track chain, and valve means for connecting said supply conduit to a fluid reservoir when the piston has been moved into engagement with the forward stop means.

4,681,377

FLEXIBLE BELT FOR ENDLESS TRACKS MADE FROM A PLURALITY OF SEGMENTS

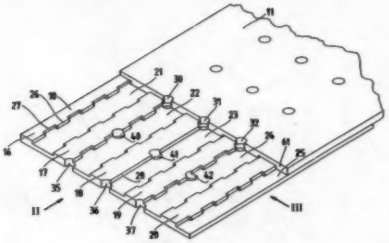
Howard S. Atkin, Sutton Coldfield, and Geoffrey A. Forth, Hartford, both of England, assignors to Dunlop Limited, England

Filed Jul. 2, 1985, Ser. No. 753,046

Claims priority, application United Kingdom, Jul. 17, 1984, 8418190

Int. Cl.[4] B62D *55/24*

U.S. Cl. 305—35 EB **9 Claims**



1. A flexible belt comprising a plurality of belt segments arranged in series in the direction of the length of the belt, each segment having a face shaped to interlock with the face of an adjacent segment when placed in face-to-face relationship with respective faces of successive adjacent segments overlapping along the length of the belt; clamping means arranged to press said overlapping faces of respective adjacent segments towards one another to secure said adjacent segments together, each of the overlapping faces being provided with traction-transmitting formations arranged to interlock with corresponding traction-transmitting formations provided on the other of the overlapping faces so as to key the overlapping faces together said traction-transmitting formations comprising a series of ribs and intervening grooves extending longitudinally of each belt segment, the sides of the ribs having a pattern which interlocks with that of an adjacent segment.

4,681,378

MODULAR CABLE MANAGEMENT SYSTEM FOR RELATED ELECTRONICS EQUIPMENT

Nat Hellman, III, Beverly Hills, Calif., assignor to Microcomputer Accessories, Inc., Los Angeles, Calif.

PCT No. PCT/US85/00180, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/04494, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 4, 1985, Ser. No. 866,399

Int. Cl.[4] A47B *87/02*

U.S. Cl. 312—108 **12 Claims**

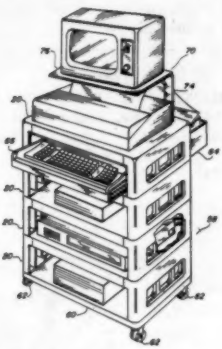
1. An electronic equipment cable management system module comprising:

(a) a top panel having a flat upper surface with a slot centrally located therein, auxillary mounting holes extending therethrough, reinforcing members on the underside and a channel formed in the rear;

(b) a pair of opposed side panels each having a top, bottom, and two ends with both ends having an integral vertical cable recess with cap engaging means at each end, also the side panels having attachment means at the upper ends thereof for connecting to opposite sides of said top panel, forming a channel shaped modular structure that comprises a raised surface upon which electronic equipment may be mounted;

(c) a rear channel cover having a plurality of breakaway tabs integral therewith resiliently fastened to said channel formed in the rear defining a rear channel cover enclosed raceway for receiving cablery from said electronic equipment, allowing egress of cables at selected locations by removal of selected tabs;

(d) a plurality of side cable recess covers in "U" shape having both ends open contiguously joined with said side panel recess forming an open ended passageway with the side panel recesses at the rear end in communication with the rear channel cover enclosed raceway;



(e) at least two top corner caps frictionally connected to said top panel at the end opposite the rear end, with the corner caps having means for superimposing the interface of said top and side panels cosmetically enveloping the juncture;

(f) a plurality of removable bottom corner caps, each having a resilient foot diposed thereunto frictionally connecting the bottom corner caps to the bottom corners of said side panels, said removable bottom corner caps providing a resilient base allowing said module to rest upon a flat surface without slipping; and,

(g) said channel shaped modular structure allowing electronic equipment to be disposed upon the panel, such as a computer printer with space between the sides allowing storage for paper, said panel slot providing access for paper to be fed into printers having bottom loading capabilities.

4,681,379

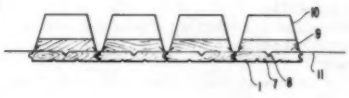
SLIDING SHUTTER DOOR SECTIONAL WARDROBE

Bruno Pillinini, Via Paschini 11, 33028 Tolmezzo (UD), Italy

Continuation of Ser. No. 669,686, Nov. 9, 1984, abandoned. This application Dec. 11, 1986, Ser. No. 941,558

Int. Cl.[4] E06B *9/14*

U.S. Cl. 312—297 **8 Claims**



1. A sliding shutter door sectional wardrobe, particularly for floor-to-ceiling building wardrobes and for built-in wardrobes, comprising:

a guide floor frame to which is attached an upward disposed sliding shutter door track-way;

a guide ceiling frame to which is attached a downward disposed sliding shutter door track-way;

guide frame supporting means to connect and support rigidly said guide floor and ceiling frames;

at least one sliding shutter door comprising a plurality of rolling hinged lath means, said sliding door disposed between said floor and ceiling trackways, to close the composite wardrobe frontally and laterally; wherein said sliding shutter door comprises an interior hinged lath connection consisting of a plurality of exterior laths and corresponding opposed glued interior counterlaths enclosing between the opposed glued surfaces a connecting flexible sheet to provide the hinging function and wherein each counterlath comprises a reinforcing straightening profile means mounted thereon, each said reinforcing profile means being of tubular configuration with side flanges which cover the lateral edges of each counterlath to encase each counterlath.

4,681,380

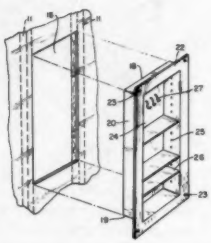
METHOD FOR PROVIDING WALL STORAGE

Bruce Carlin, 9 D Childs Rd., Bernardsville, N.J. 07924

Filed Nov. 4, 1985, Ser. No. 794,828

Int. Cl.[4] A47B *67/02*

U.S. Cl. 312—242 **2 Claims**



1. An apparatus for providing a pantry storage compartment in the cavity of a wall, said cavity defined by the space between adjacent studs in said wall and the depth of said studs comprising:

(a) a unitary plastic cabinet fittable within said cavity between said studs and extending to the depth of said studs in said wall having fixed or adjustable shelves and a rim portion extending outwardly around said cabinet and across a portion of the width of said studs, said rim portion having holes for mounting said cabinet to said studs; and

(b) a template for outlining said cavity between said studs against the wall to permit cutting of said wall to expose said cavity.

4,681,381

REMOVABLE DRAWER SLIDE AND INTERLOCK WITH DRAWER

Douglas Sevey, Waterloo, Iowa, assignor to Waterloo Industries, Inc., Waterloo, Iowa

Filed Oct. 16, 1986, Ser. No. 919,686

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—333 **7 Claims**

1. A drawer and interlocking drawer mechanism, comprising, in combination:

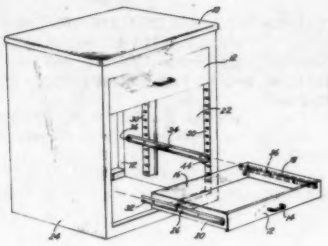
a drawer;

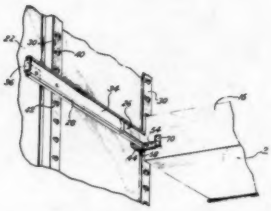
a pair of slides with one slide attached to each side of the drawer;

a pair of slide receivers mateable with the slides, each slide receiver having a pair of guide pins adapted to support the slide receiver;

a plurality of slide receiver supports each having a plurality of openings mateable with the guide pins such that when the guide pins are inserted into one of the openings in each support, the slide receivers are supported by the slide receiver supports;

a pair of slide locks rotatably mounted on each slide receiver and adapted to rotatably move between a lock position against one of the slide receiver supports and an open position away from the same support, each slide lock having a drawer catch; and





a pair of drawer stops, each rotatably mounted on the drawer and adapted to rotate between a catch position where the drawer stop will catch the drawer catch at one point during movement of a slide in the slide receiver and a release position where the drawer stop will never catch the drawer catch during movement of the slides in the slide receivers, whereby the slide receivers are releasably held in fixed position by the slide locks, and the drawer may be removed from the slide receivers by rotating the drawer stops to the release position and withdrawing the drawer from the slide.

4,681,382

ELECTRICAL CONNECTOR FOR TRANSMISSION CABLE

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1985, Ser. No. 811,965

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—92 **18 Claims**

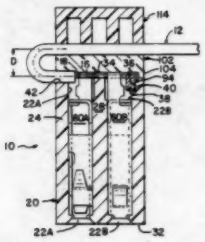
1. An electrical connector for electrical transmission cable means having signal conductor means and ground conductor means, comprising:

a housing means having at least one row of terminal-receiving passageways extending from a mating face to a termination face;

contact terminals disposed in said terminal-receiving passageways, each said terminal having a contact section means proximate said housing mating face and a conductor-connecting section proximate said housing termination face;

a ground bus secured in a bus-receiving channel of said housing means in interference fit therein along said housing termination face parallel to said at least one row of

terminal-receiving passageways, said ground bus having means for connecting with ground conductor means; means for grounding said ground bus; and



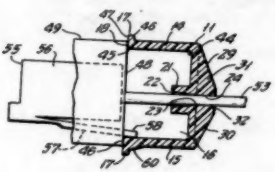
cable-securing means to secure and provide strain relief for an end portion of the transmission cable means and protect the terminations following termination of the signal conductor means to respective said contact terminals and of the ground conductor means to said ground bus.

4,681,383

RESILIENT SEALING DEVICE FOR TELEPHONE SUBSCRIBER TERMINALS

Peter Hung, Wheatley Heights, and Paul V. De Luca, Plandome Manor, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Apr. 25, 1986, Ser. No. 856,022
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—135 **3 Claims**



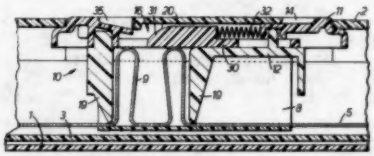
1. An improved resilient sealing device for closing an opening in an exposed surface of a plug body which accommodates a jack body, the jack body having a laterally extending manually engageable release lever comprising: a moulded body having a principal axis of resilient material including a transversely extending outer wall element and a plurality of side wall members extending longitudinally from said outer wall element to define a generally rectangular void; said side wall elements terminating in a continuous free edge having a laterally extending continuous sealing flange thereon; said outer wall element having an inner planar surface, and a cross section which varies in thickness to be most thick at the geometric center thereof, and having a continuous through ovate bore extending from said inner planar surface to an oppositely disposed outer surface thereof for selectively clamping a surface of a flattened cable interconnecting with said plug body; whereby, upon the engagement of said jack body within said plug body, said device may be moved along said cable to create a compressive force at said laterally extending flange resulting in a sealing action.

4,681,384

ELECTRIC SOCKETS

John Newman, Buckinghamshire, England, assignor to Rotaflex PLC, London, England

Filed May 7, 1985, Ser. No. 731,316
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—137 **13 Claims**



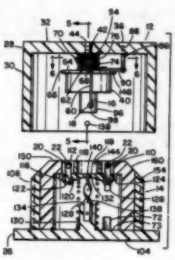
1. An electric socket outlet comprising a fascia member including a recessed front face portion, a plurality of openings in said recessed portion for the pins of an electric plug to enter and pass into cooperation with respective socket contacts, and an outer shutter mounted on said recessed portion so as to lie at the most substantially flush with the front face of the fascia member, said shutter being slidable between closed and open positions, in said closed position the shutter covering said pin openings and the socket outlet presenting a substantially solid appearance in front view, and in said open position the openings being exposed for entry of the plug pins, and a guide groove in the front face of the fascia member for guiding a plug pin into abutment with the outer shutter for moving the shutter from the closed to the open position.

4,681,385

ELECTRICAL CONNECTOR SYSTEM

Kurt J. Kruger, Huntington, and Lester Miller, Danbury, both of Conn., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Apr. 11, 1986, Ser. No. 851,408
Int. Cl.[4] H01R *4/48*
U.S. Cl. 439—252 **20 Claims**



1. An electrical connector system comprising:

a plug assembly having a pair of electrical plug terminal means each spaced an equal distance from the axis of said plug assembly;

a socket assembly having a pair of electrical socket terminal means each spaced an equal distance from the axis of said socket assembly, said plug terminal means and said socket terminal means being engagable one with respect to the other to form an electrical connection therebetween when said plug assembly and said socket assembly are joined in axial alignment, virtually independent of the rotational position therebetween;

a coil spring to urge said plug terminal means and said socket terminal means towards each other to insure a secure electrical contact therebetween when the assemblies are joined; and

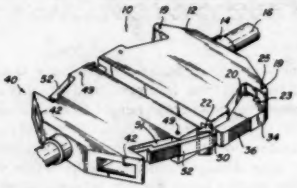
shielding means on one of said socket assembly and said plug assembly to prevent access to said plug terminal means and said socket terminal means when said plug assembly and said socket assembly are joined in axial alignment.

4,681,386

INTEGRAL CONNECTOR HAVING PLASTIC SPRING-CLIPS

Edward Boulanger, Hamden, Conn., assignor to Lance Wire and Cable, Inc.

Filed Jan. 22, 1986, Ser. No. 820,741
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—347 **4 Claims**



1. An electrical connector for connection to a panel having an opening therethrough or to a second connector comprising,

a plastic housing for reception of a multi-wired cable at the rear end thereof and a multi-contact plug at the front end thereof;

said housing having first and second side walls between said front end and said rear end;

a first pair of front flanges extending outwardly from said side walls adjacent said front end;

a second pair of rear flanges extending outwardly from said side walls adjacent said rear end,

a first plastic spring clip along said first side wall and having a forward end extending forwardly of said housing and having a rear portion;

a second plastic spring clip along said second side wall and having a forward end extending forwardly of said housing and having a rear portion;

said rear flanges having first and second openings respectively receiving said rear portions of said spring clips;

means pivotally supporting said spring clips on said rear flanges;

means integral with said spring clips for biasing said forward ends away from one another; and

first and second shoulders respectively formed on the forward ends of said spring clips and extending outwardly therefrom, said first and second shoulders formed with outwardly tapering surfaces and with recesses rearwardly of said tapered surfaces.

4,681,387

LATCH CONNECTOR

Albert W. Paddock, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

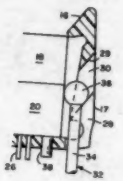
Filed Nov. 21, 1986, Ser. No. 933,430
Int. Cl.[4] H01R *13/633*
U.S. Cl. 439—347 **3 Claims**

1. A latch connector for releasably securing a pair of electrical connectors together comprising:

a. a latch connector body including a base portion having holes therein for receiving pin conductors of a first of said pair of connectors therethrough;

b. a pair of upstanding end latch portions extending from said base portion and having hook portions at the distal ends thereof for engagement with the second of said pair of connectors for retention of said connectors in secured relation;

c. said end latch portions having a groove therethrough extending from said base portion and terminating intermediate said base portion and said hook portion, and, an angled circular opening extending transversely through said end latch portions and in communication with said groove; and



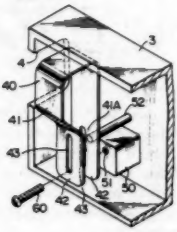
d. unlatching means disposed in each of said angled circular openings and cooperating with said upstanding end latch portions to effect disconnection of said latch connector from said second of said pair of electrical connectors, by flexing said end latch portions for release of said hook portions from said second of said pair of connectors.

4,681,388

CORD CLAMPING MECHANISM

Akira Nakazawa; Shigeru Kikuta; Kihachiro Koike; Kensaku Matsuoka, and Yoshimitsu Nishino, all of Tokyo, Japan, assignors to Hirose Elec. Co., Ltd.; NEC Corporation and Japan Aviation Elec., all of Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,315
Claims priority, application Japan, Apr. 4, 1985, 60-50183[U]
Int. Cl.[4] H01R *13/58*
U.S. Cl. 439—449 **3 Claims**



1. A cord clamping mechanism comprising a cord clamp, a clamp mounting base for mounting the cord clamp, said cord clamp having a ring-shaped portion for passing a cord to be clamped, and a pair of legs extending from both ends of the ring-shaped portion for clamping the cord passed through the ring-shaped portion when the legs are closed, said legs being formed with openings for passing a clamping screw for closing the clamp and mounting fixedly on the base, said base being formed with a threaded opening for receiving the screw, and a guiding projection to be inserted into the opening at a position near the ring-shaped portion between the screw and the ring-shaped portion when the clamp is mounted on said base.

4,681,389

LOCK PIN FOR MOUNTING BOARD-MOUNT TYPE CONNECTOR ON BOARD

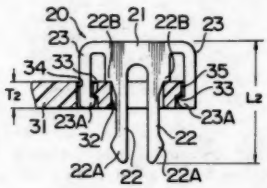
Akira Nakazawa; Shigeru Kikuta; Kihachiro Koike; Kensaku Matsuoka, and Yoshimitsu Nishino, all of Tokyo, Japan, assignors to Hirose Elec. Co., Ltd.; NEC Corporation and Japan Aviation Elec., all of Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,314

Claims priority, application Japan, Apr. 4, 1985, 60-50182[U]

Int. Cl.⁴ H02B *1/02*

U.S. Cl. 439—557 **3 Claims**



1. A lock pin for mounting a board-mount type connector on a board, wherein the board-mount type connector includes one member having an upper surface and a lower surface and a lock pin mounting opening passing through from the upper surface to the lower surface, the one member further having shoulders formed at the periphery of the lock pin mounting opening and below the upper surface, the board having a lock pin inserting opening formed therein correspondingly to the lock pin mounting opening of one member, the lock pin comprising:

an unitary piece of elastic material, said elastic material having an upper lateral arm, a pair of spaced long central legs respectively extending downwardly from the center of said upper lateral arm, and a pair of spaced short outside legs respectively extending downwardly from the upper lateral arm along the outside of said central legs, said central legs being respectively formed at the roots thereof with shoulders to be engaged with the periphery of the lock pin mounting opening at the upper surface of the one member and at the lower ends thereof with side projections to be engaged with the periphery of said lock pin inserting opening of the board, said outside legs being respectively formed at the lower ends thereof with side projections extending therefrom for engaging a lower surface of said shoulders of the one member, whereby said lock pin can be held fixedly with the one member with the central legs being projected from the lower surface side of the one member over a considerable length by inserting the lower ends of said central legs into said lock pin mounting opening from the upper surface side of the one member so that said shoulders at the roots of said central legs are respectively engaged with the upper surface of the one member and said side projections of said outside legs are respectively engaged with said shoulders of the one member, and then the lower ends of said central legs thus projected are adapted to be inserted into said lock pin inserting opening of the board.

4,681,390

NON-RADIATING COAXIAL OUTLET

Robert D. Hayward, Phoenix, Ariz., assignor to Gilbert Engineering Company, Inc., Del.

Filed Jul. 21, 1986, Ser. No. 887,439

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 439—578 **14 Claims**

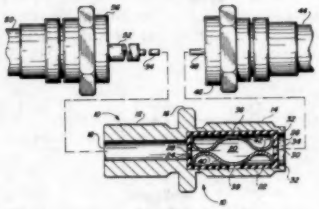
1. A non-radiating coaxial cable coupler for connecting a terminal device to a system, said system and said device being coupled to first and second coaxial cables, respectively, each said first and second coaxial cables having concentric inner and outer conductors, said coupler comprising:

a. first and second longitudinally aligned coaxial sections;

b. said first section adapted for coupling to the first coaxial cable and having a first cavity therein;

c. insulating means positioned within said first cavity;

d. contact means disposed within said insulating means for detachably receiving and contacting the inner conductors of the first and second coaxial cables; and



e. said second section adapted for coupling to said second coaxial cable and having a second cavity therein, said second cavity being dimensioned and configured to act as a waveguide having a cutoff wavelength substantially below the wavelength spectrum of said system;

whereby there is substantially no electromagnetic radiation from or into said coupler when said second cable is not coupled thereto.

4,681,391

ELECTRIC CONNECTOR

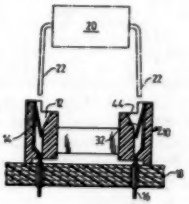
Jean C. Bouley, Dole, France, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 6, 1985, Ser. No. 805,665

Claims priority, application France, Dec. 19, 1984, 84 19441

Int. Cl.⁴ H01R *33/76*

U.S. Cl. 439—444 **8 Claims**



1. In an electrical connector particularly for use in mounting an electronic component having two parallel rows of terminals to a support, such as a printed circuit board, said connector comprising an insulating block having two rows of cavities, each cavity containing a contact element introduced through an opening provided at the top of said cavity, said contact element including a leg projecting through a substantially sealed passage at the bottom of said cavity for connection with said support, the improvement comprising said contact element comprises a substantially flat web portion pressing against a substantially flat first wall of said cavity adjacent to an external longitudinally extending face of said insulating block, the central portion of said web portion being cut out and bent to form a substantially flat contact tab extending out of the plane of said web portion, said tab being resiliently urged to engage a lower portion of a second wall of said cavity opposite to said first wall in the absence of a mating terminal being received in said cavity, said lower portion being substantially

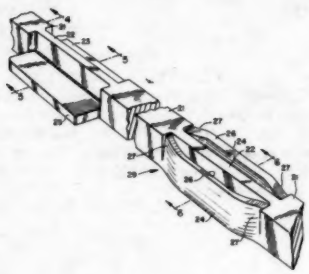
flat, said tab being adapted to cooperate with a male contact element which is inserted into said cavity, said tab being in the form of a rectangle extending generally along the length of said web portion which is also rectangular, an upper side of said rectangle of said tab forming an articulation with the top of said web portion and a side of said tab opposite to said upper side of said rectangle of said tab forming a rectilinear free end adapted to cooperate with said male contact element, said web portion being connected to said leg by two bent portions such that said leg is offset from said web portion such that said leg extends substantially as an extension of said lower portion of said second wall and being substantially in alignment with said free end of said tab, whereby said leg is aligned with said male contact element.

4,681,392

SWAGED COMPLIANT CONNECTOR PINS FOR PRINTED CIRCUIT BOARDS

Robert S. Terita, Trumbull, Conn., assignor to Bead Chain Manufacturing Company, Bridgeport, Conn.

Filed Apr. 21, 1986, Ser. No. 853,890
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—751 **8 Claims**



1. A compliant connector pin for interfering force fit insertion in a plated through hole of a printed circuit board, formed entirely from original wire stock in coining and forming operations producing substantially no scrap, comprising

an elongated segment of wire stock with chamfered wire-wrap ends, having its original maximum wire stock diameter selected to be less than the internal diameter of each said through hole,

a stamped board-engaging portion formed at an intermediate point between said chamfered ends of said segment, with an extended cross-section having a maximum dimension exceeding the internal diameter of each said through hole,

said board-engaging portion being formed with a central web extending substantially across the full width of the wire stock, and with a pair of lateral wing flanges of substantially uniform thickness between about 44% and about 78% of the thickness between of the central web and extending cantilever-fashion in two opposite directions from a first side of said central web, said central web remaining substantially undeformed during and after the stamping of said wing flanges,

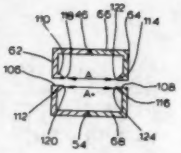
each of said wing flanges being smoothly curved toward the other, opposite side of the web, whereby the stamped board-engaging portion of said elongated segment is formed with a cross-section in the shape of the Greek letter epsilon.

4,681,393

ELECTRICAL CONNECTOR ASSEMBLY

Minoru Fukishima, Yokohama, and Shinsuke Kunishi, Yamato, both of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 9, 1985, Ser. No. 773,952
Claims priority, application Japan, Oct. 11, 1984, 59-213235
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—851 **13 Claims**



1. An electrical connector assembly including

a female terminal having a body with a mating end and a circuit-connecting end, the body defining a terminal-receiving opening in said mating end and a terminal-receiving passageway inwardly extending from said opening, and

a male terminal telescopically receivable in said terminal-receiving passageway to electrically engage said body of said female terminal,

the improvement comprising:

said body of said female terminal including an elongated generally hollow sleeve defining said passageway, with first and second spaced-apart longitudinally extending opposed slits forming first and second laterally opposed pivotally moveable sidewalls having normally abutting edges immediately adjacent said slits, said first slit extending along the entire length of the sleeve, said second slit extending from the mating end along a portion of the length of the sleeve, and a bight portion adjacent said second slit joining said two sidewalls, said bight portion extending the remaining length of the sleeve and biasing said mating edges in abutting engagement, whereby said sidewalls are adapted to be spread apart at the slits upon exertion of internal forces against the sleeve; and

a pair of generally opposed inwardly extending rigid terminal-engaging projections formed on said two sidewalls, each having first and second end portions extending into said terminal receiving passageway and located adjacent said first and second slits, respectively, said first end portions having a closer spacing therebetween than said second end portions to impart a greater spreading displacement to said mating edges adjacent said first slit when said male terminal is inserted between said projections, resulting in substantially uniform electrical contact pressures against said male terminal.

4,681,394

LIGHT BEAM SCANNING SYSTEM

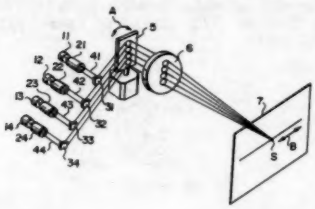
Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1986, Ser. No. 833,621
Claims priority, application Japan, Mar. 1, 1985, 60-40685
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 **2 Claims**

1. A light beam scanning system in which laser beams emitted by a plurality of semiconductor lasers are combined into a single laser beam and the single laser beam is caused to sweep a surface-to-be-scanned, characterized in that the oscillation wavelengths of the semiconductor lasers are selected so that

the oscillation wavelengths λi and λj of any two of the semiconductor lasers satisfy the formula

$$|\lambda i - \lambda j| \geq \lambda i \lambda j M/c$$



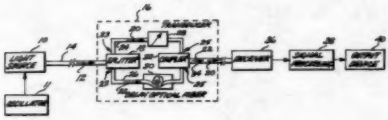
wherein M and c respectively represent the picture element frequency and the velocity of light.

4,681,395

TIME-DOMAIN INTENSITY NORMALIZATION FOR FIBER OPTIC SENSING

Thomas A. Lindsay, Brier, and Randall E. Morton, Redmond, both of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed Feb. 22, 1985, Ser. No. 704,324
Int. Cl.[4] G02B *6/28;* G02F *1/015*
U.S. Cl. 350—96.16 **22 Claims**



1. A fiber optic sensing system comprising:

(a) a source for producing an optical signal of any selected intensity;

(b) a receiver;

(c) an optical waveguide element interconnected between the source and the receiver, the optical waveguide element providing a single path for propagation of the optical signal between the source and the receiver;

(d) a sensor unit connected to the optical waveguide element between the source and the receiver, the sensor unit including two branch optical waveguides, each branch optical waveguide having an input end and an output end, the branch optical waveguides being coupled in common to the optical waveguide element at both their input and output ends, the branch optical waveguides being configured and arranged so that a component of the optical signal propagates through each branch optical waveguide;

(e) delay means coupled to one of the branch optical waveguides between its input end and its output end for delaying the propagation of the component of the optical signal that is associated with the branch optical waveguide to which the delay means is connected; and,

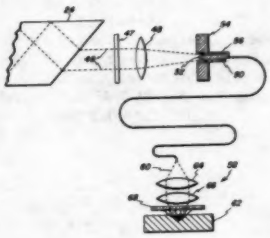
(f) transducer means associated with one of the branch optical waveguides between its input end and its output end for varying the intensity of the component of the optical signal that is asssociated with the branch optical waveguide to which the transducer means is connected.

4,681,396

HIGH POWER LASER ENERGY DELIVERY SYSTEM

Marshall G. Jones, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,125
Int. Cl.[4] G02B *6/32;* H01S *3/30;* B23K *9/00*
U.S. Cl. 350—96.18 **3 Claims**



1. An improved high power laser energy delivery system comprising:

a solid-state total-internal-reflection face-pumped laser for producing a near infrared or visible wavelength laser beam which has an average power output level greater than 400 watts and a beam divergence less than one milliradian;

a single fiber optic serving as a light guide and having a diameter less than 600 micrometers and a given numerical aperture;

at least one focusing lens having a given focal length and which focuses said laser beam on one end of said fiber optic to a spot having a size smaller than the fiber diameter, where spot size is proportional to the product of lens focal length and laser beam divergence, and with a beam cone angle less than twice said numerical aperture so that laser energy entering said fiber is transmitted by total internal reflection to emerge at the other end; and

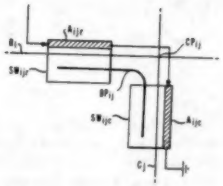
an optical system coupled to the other end of said fiber to focus the emerging laser beam onto material to be processed.

4,681,397

OPTICAL SWITCHING ARRANGEMENT

Vipul Bhatt, Lincoln Park, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 28, 1985, Ser. No. 750,722
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **8 Claims**



1. Optical apparatus adapted for switching information from a first to a second waveguide, said apparatus comprising first and second sleeve switches, said first sleeve switch comprising said first waveguide and a third waveguide in spaced apart first positions at which only negligible coupling occurs therebetween, said second sleeve switch comprising said second waveguide and said third waveguide in spaced apart first positions at which only negligible coupling occurs therebetween, each of

said first and second sleeve switches including actuator means for moving the respective waveguides to second relatively close positions at which significant coupling occurs between said respective waveguides, said respective waveguides being adapted to permit information coupling therebetween.

4,681,398

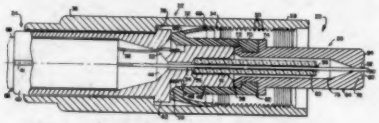
FIBER OPTIC CONNECTOR AND METHOD OF ASSEMBLY

James R. Bailey, Chicago, and Eric L. Long, Northbrook, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Continuation of Ser. No. 455,400, Jan. 3, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 808,687

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **23 Claims**



1. A fiber optic connector assembly comprising:

tubular means for supporting an axially disposed optical fiber end portion having a substantially flat end surface; and

apertured wall means disposed transversely of said tubular means and secured thereto for receiving said optical fiber end portion and supporting said end surface of the optical fiber end portion in fixed spaced relationship with respect to said wall means, said wall means including rigid surface means curved concavely in the radial direction with respect to said optical fiber end portion for reflecting light relative to said end surface of the optical fiber end portion.

4,681,399

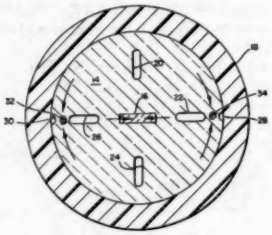
STRESSED CORE OPTICAL FIBER AND METHOD

John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 1, 1984, Ser. No. 656,534

Int. Cl.⁴ G02B *6/16*

U.S. Cl. 350—96.30 **28 Claims**



1. An optical waveguide comprising:

an elongated substrate having a central longitudinal axis and fabricated from an optical energy transmitting material having a nominal index of refraction; and

means for applying a compressive stress to at least one longitudinally extending cross-sectional zone of said substrate displaced from said central axis to raise the index of refraction of said zone with respect to material surrounding said zone to propagate light energy in said zone, wherein one of said substrate and said means for applying a compressive stress comprises a stressed member longitudinally extending and enclosed within the other of said substrate and said means for applying a compressive stress.

4,681,400

PLASTIC OPTICAL FIBERS

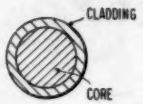
Yoshinobu Ueba, and Shinichi Miyake, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 411,381, Aug. 25, 1982. This application Jul. 26, 1985, Ser. No. 758,849

Claims priority, application Japan, Aug. 25, 1981, 56-133678

Int. Cl.⁴ B29D *11/00*; D02G *3/00*; C08F *120/18*

U.S. Cl. 350—96.34 **8 Claims**



1. A plastic optical fiber comprising a core of a copolymer of phenyl methacrylate and methyl methacrylate produced by bulk polymerization and a cladding of a copolymer of vinylidene fluoride and a fluoroolefin provided on said core, wherein the copolymer of said cladding has a melting point of at least 120° C. and a fluoroolefin content of at least 3 mol%.

4,681,401

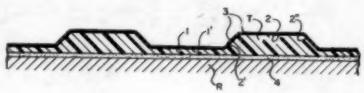
SHEET MATERIAL MARKER SURFACE FOR ROADWAYS AND THE LIKE

Charles W. Wyckoff, 85 Pine St., Needham, Mass. 02192

Continuation of Ser. No. 694,479, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 351,037, Feb. 22, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 779,297

Int. Cl.⁴ G02B *5/124*

U.S. Cl. 350—105 **9 Claims**



9. For use with a roadway surface and the like, a direction-indicating surface marker strip comprising plastic material adapted to be secured to said roadway surface, said strip being intermittently deformed upward to provide successive wedges of substantially trapezoidal shape in longitudinal vertical section, each wedge having a top surface bounded by inclined front and rear surfaces, each top surface having a substantially horizontal surface area that is substantially greater than the area of each inclined surface, successive wedges of said strip being separated by substantially horizontal surfaces each having an area substantially greater than that of each inclined surface, each inclined surface forming an angle with respect to vertical that is substantially within the range of 0 degree to 45 degrees, the height of each wedge being a small fraction of the longitudinal dimension of the top surface of the wedge, each of said inclined surfaces being provided with a surface layer of retroreflecting beads, said layer of retroreflective beads having at least a top row thereof which is visible at night to a motorist hundreds of feet away by retroreflection of vehicle headlights, the configuration, dimensions, and spacing of the wedges being selected to reduce substantially the obscuring of the marker strip by shadows of the wedges in sunlight, so that the marker strip is clearly visible to a motorist during the day as well as at night, and whereby the marker strip has a long effective life even when subjected to abrasion and dirt.

4,681,402
RAINBOW PROJECTOR

Carlton R. Tiffany, 225 Hill Rd., Douglassville, Pa. 19518

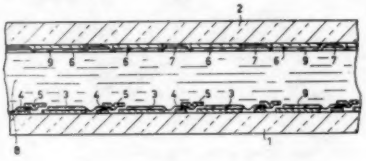
Filed Oct. 2, 1985, Ser. No. 783,091
Int. Cl.[4] G02B 5/04; F21V 3/00, 5/00
U.S. Cl. 350—286 5 Claims

1. A means for projecting a secondary rainbow of natural configuration comprising a generally arcuate prism means of at least about 180° of arc bearing a primary and secondary refractive surface wherein such surfaces meet along that single interior edge of said prism closest to the center of the arc of the prism and said primary and secondary surfaces form an active range angle from about 25° to about 75°, such that when a light source positioned at an effective angular range of less than about 30° from perpendicular relative to a plane through the interior edge of the prism, a secondary rainbow of natural configuration will be projected from the secondary refractive surface, said projecting means further comprising an orienting means attached thereto while maintaining generally full transmitability of light in the effective angular range from the primary refractive surface through the secondary refractive surface to projection material, wherein the orienting means is further comprised of a positioning means and a base means wherein the positioning means is a bar affixed at each end of said arcuate prism and said positioning bar is rotably orientable upon said base means.

4,681,403
DISPLAY DEVICE WITH MICROMECHANICAL LEAF SPRING SWITCHES

Ties S. Te Velde, and Joannes L. M. Van de Venne, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 396,534, Jul. 8, 1982, abandoned. This application Jun. 19, 1986, Ser. No. 877,696
Claims priority, application Netherlands, Jul. 16, 1981, 8103377
Int. Cl.[4] G02F 1/01, 1/133
U.S. Cl. 350—334 35 Claims

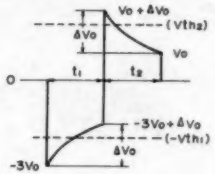


1. A display device comprising two separated supporting plates; an electro-optical medium disposed between said supporting plates, wherein said electro-optical medium includes one of a liquid crystal, an electrophoretic suspension, or an electrochromic material; a plurality of picture electrodes formed in rows and columns on facing surfaces of said supporting plates to form a system of picture elements; a system of column electrodes disposed with said picture electrodes on one of said supporting plates; a system of row electrodes disposed below said picture electrodes on a second of said supporting plates; an insulating layer disposed between said picture electrodes and said row electrodes wherein each of said picture electrodes includes an aperture at an area over a row electrode, said row electrode being free of said insulating layer at said aperture; switching means including at least one electrostatically controllable micromechanical leaf spring being disposed in each of said apertures for providing connection between said picture electrode and said row electrode, said micromechanical leaf spring only being a metal free of any insulating layer; and an electrically conductive covering hood extending over said aperture to protect said leaf spring from said electro-optical medium.

4,681,404
LIQUID CRYSTAL DEVICE AND DRIVING METHOD THEREFOR

Shinjiro Okada, Kawasaki, and Junichiro Kanbe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,651
Claims priority, application Japan, Oct. 4, 1984, 59-209255
Int. Cl.[4] G02F 1/133
U.S. Cl. 350—350 S 31 Claims



1. A liquid crystal device comprising a plurality of picture elements arranged in a plurality of rows; each picture element comprising a pair of oppositely spaced electrodes and a ferroelectric liquid crystal disposed between the electrodes and showing a first stable state and a second stable state depending on an electric field applied;

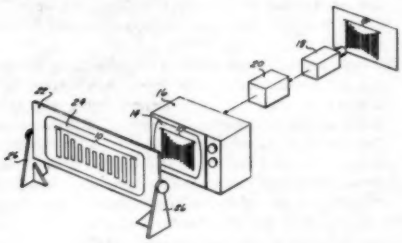
said liquid crystal device being driven by sequentially orienting the ferroelectric liquid crystal at selected picture elements on a selected row to the first or second stable state to write in the picture elements row by row;

said ferroelectric liquid crystal having a volume resistivity of 1×10^9 Ω.cm or larger.

4,681,405
METHOD AND LENS FOR PRODUCING A WIDE ANGLE IMAGE

Thomas K. Balogh, 1940 Golfview, Apt. 202, Troy, Mich. 48084, and John M. Balogh, 5129 Kolmar, Chicago, Ill. 60648

Filed Oct. 1, 1984, Ser. No. 656,588
Int. Cl.[4] G02B 13/08, 3/08, 21/60
U.S. Cl. 350—420 10 Claims



1. A method of creating an image of a horizontally disposed field of visual features including the steps of:

forming a record of said field which record comprises a representation of said features compressed along the horizontal axis of said field;

forming a viewable but width distorted image of said horizontal axis compressed record by displaying said record on a television screen;

viewing the width distorted image through a lens positioned before said television screen displaying said viewable but distorted image, which lens is cofigured to create an ex-

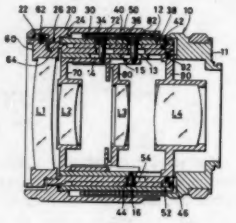
panded width corrected viewable image of said television screen display, which expansion is only along the horizontal axis and which expansion corresponds to the degree of compression carried out in said step of forming said record, whereby said expanded image corresponds substantially exactly to said field of visual features.

4,681,406

ZOOM LENS ASSEMBLY

Hideshi Naito; Yoshiro Kodaka, both of Tokyo, and Yoshiharu Shiokama, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,195
Claims priority, application Japan, Jan. 20, 1984, 59-8126
Int. Cl.[4] G02B 7/10
U.S. Cl. 350—429 **10 Claims**



8. A zoom lens assembly comprising:

(a) an optical system including first, second and third lens units arranged in that order as viewed from the object side;

(b) a stationary cylindrical housing member;

(c) an operation member movable relative to said housing member, said operation member being moved axially along the optical axis for zooming and being rotated about the optical axis for focusing;

(d) first, second and third lens holding members for holding said first, second and third lens units, respectively, said lens holding members being movable in the direction along the optical axis independently of each other and relative to said housing member;

(e) first interlocking means for connecting said first holding member with said operation member to move said first holding member in the direction along the optical axis during the time that said operation member is rotated about the optical axis;

(f) a cam member mounted axially movable along the optical axis and rotatable about the optical axis relative to said housing member, said cam member being disposed between said operation member and each of said second and third lens holding members and having a cam connection means so formed that when said cam member is rotated about the optical axis, said second and third lens holding members are moved individually in the direction along the optical axis by said cam member and when said cam member is axially moved, said second and third lens holding members are moved together with said cam member in the direction along the optical axis; and

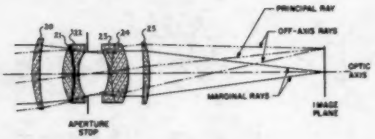
(g) second interlocking means for connecting said cam member with said operation member to rotate said cam member about the optical axis while moving said cam member in the direction along the optical axis during the time that said operation member is moved in the direction along the optical axis and to move said cam member in the direction along the optical axis during the time that said operation member is rotated about the optical axis.

4,681,407

TWO-GLASS PHOTOGRAPHIC OBJECTIVE COLOR-CORRECTED AT FOUR WAVELENGTHS

Romeo I. Mercado, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1985, Ser. No. 803,173
Int. Cl.[4] G02B 9/36
U.S. Cl. 350—471 **6 Claims**



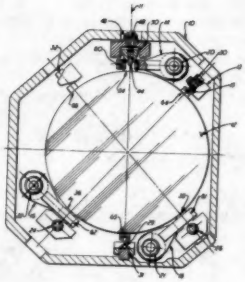
1. An optical objective comprising six lens elements positioned coaxially with respect to each other along an optic axis, said six lens elements being made from only two different optical materials, at least one of said lens elements being made from a first one of said optical materials, at least one other of said lens elements being made from a second one of said optical materials, said lens elements coacting with each other so that paraxial marginal rays passing through said objective are brought to a common focus on a common focus on said optic axis at four discrete wavelengths.

4,681,408

ADJUSTABLE MOUNT FOR LARGE MIRRORS

Anees Ahmad, Bethel, and Richard Huse, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 28, 1986, Ser. No. 856,881
Int. Cl.[4] G02B 7/18
U.S. Cl. 350—609 **6 Claims**



1. A mirror mounting apparatus comprising:

a mirror;

a housing;

three individual tangent bars having a first end and a second end;

each of said three individual tangent bars having the first end thereof rotatably mounted to said housing through a first spherical bearing and the second end thereof rotatably mounted to said mirror through a second spherical bearing;

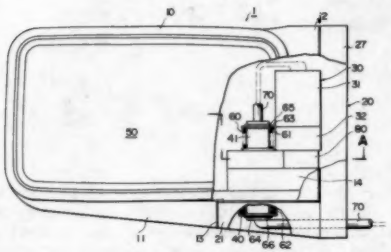
the first spherical bearing having an axis perpendicular to the plane of said mirror; and

the second spherical bearing having an axis perpendicular to both the axis of said first spherical bearing and to a line tangent to the point of contact on said outer circumference of said mirror of said tangent bar.

4,681,409
OUTSIDE REAR VIEW MIRROR

Masao Enomoto, Hatano, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,655
Claims priority, application Japan, Dec. 17, 1983, 58-237187; Dec. 17, 1983, 58-237188; Apr. 13, 1984, 59-53491[U]; Jun. 15, 1984, 59-89215[U]
Int. Cl.[4] G02B 5/08, 7/18; B60R 1/06
U.S. Cl. 350—637 20 Claims

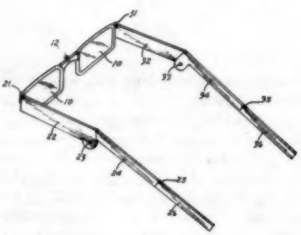


1. An outside rear view mirror, comprising:
a base;
a spindle having a longitudinal axis and secured to said base;
a mirror housing provided with a mirror and rotatably secured to said spindle;
a drive motor attached to said mirror housing and communicating with a power supply; and
gear means for mechanically engaging said drive motor with said spindle, said gear means including at least two gears, a first gear of the at least two gears being rigidly secured to an output shaft of said drive motor and a second gear of the at least two gears being secured to said spindle and engageable with said first gear so that rotation of said housing around said axis of said spindle occurs when sdid drive motor is activated by said power supply;
means for absorbing an impact of an external force applied to said mirror housing in a direction non-coincident with said longitudinal axis of said spindle, said absorbing means including means for releasing said spindle for rotation for permitting rotation of said gear means as a unit relative to said base when said external force exceeds a certain predetermined level.

4,681,410
FOLDABLE EYEGLASSES

Al W. Paulsen, 706 W. 8th, Gillette, Wyo. 82716

Filed Jun. 14, 1985, Ser. No. 744,533
Int. Cl.[4] G02C 5/08, 5/14
U.S. Cl. 351—63 2 Claims

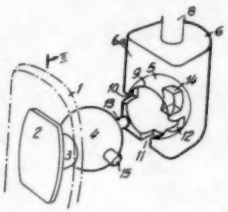


1. Foldable eyeglasses comprising:
(a) A pair of lenses connected by a hinged bridge allowing the lenses to open to a position suitable for use as reading glasses, and to close to a position such that the front surfaces of the lenses fold together;
(b) Temples hingedly connected to the frames of said lenses, each temple comprising a number of foldable segments connected by hinges so that in the folded position the segments stack vertically to form one exterior face of the folded assembly, with the lenses entirely covered and folded between the exterior faces.

4,681,411
EYEGLASS NOSEPIECE HOLDER

Lorenzo Taddei, Mantova, Italy, assignor to Comet - Costruzione Occhiali Metallo S.p.A., Volta Mantovana MN, Italy

Filed Oct. 8, 1985, Ser. No. 785,634
Claims priority, application Italy, Oct. 19, 1984, 18119 A/84
Int. Cl.[4] G02C 5/12, 1/00
U.S. Cl. 351—137 7 Claims



1. An eyeglass nosepiece holder comprising a ball-socket connection for removably connecting a nosepiece to an eyeglass frame,
said ball-socket connection including:
a ball element having an outer substantially spherical shape defining a ball element diameter and an outer surface area,
first and second pin elements projecting from said outer substantially spherical shape of said ball element and being rigid with said ball element, said first and second pin elements having respectively first and second pin element cross dimensions and said second pin element defininig a second pin element rotation axis,
a socket body made of elastically deformable material and having an outer delimitation wall,
an internal recess in said socket body for accomodating therein said ball element, said internal recess having an introduction mouth formed in said outer delimitation wall of said socket body and an internal partially cut away spherical shape defining a recess diameter substantially equal to said ball element diameter, said introduction mouth having a width smaller than said ball element diameter and said internal partially cut away spherical shape having an inner surface area greater than half of said outer substantially spherical shape of said ball element,
a notch formation extending from said recess within said socket body and having lateral delimitation walls defining a notch formation cross dimension greater than said first pin element cross section, said notch formation accomodating said first pin element and said lateral delimitation walls defining a lateral stop for said first pin element, and
a first lateral cutout extending from said introduction mouth of said internal recess in said socket body and from said outer delimitation wall of said socket body to said internal recess, said first lateral cutout having a bottom delimitation wall opposed to said introduction mouth and two lateral delimiting walls, said lateral delimiting walls fittingly accomodating said second pin element cross dimension,
thereby said socket body made of elastically deformable material together with at least said first lateral cutout

defining a snap engagement member for said ball element, and said notch formation allowing a limited movement of said first pin element within said notch formation and a limited rotation of said ball element with said internal recess with said second pin element sliding along said first lateral cutout and rotating around said second pin element rotation axis.

4,681,412

CONTACT LENS CONTAINING LIGHT SENSITIVE MATERIAL

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Oct. 1, 1984, Ser. No. 656,313
Int. Cl.[4] G02C *7/04, 7/10*
U.S. Cl. 351—162 **7 Claims**

1. A protective and corrective eye lens for use against the eye of a person comprising:

(a) a contact lens base defining a unitary molding of substantially circular configuration formed of a clear plastic resin and having a rear surface which is configured and adapted to be disposed in conformance with the central portion of the front of the eye of a person wearing said contact lens,

(b) said contact lens having a circular central portion forming a part of said unitary molding with said lens base, which central portion is operable to receive and transmit therethrough ambient light directed at a person wearing said lens, said central portion of said lens being located so as to pass the light it receives through the cornea and pupil of the eye to the lens of the eye when said contact lens is operatively disposed against the eye of said person,

(c) said contact lens including said circular central portion thereof being shaped to correct aberrations in the vision of the person wearing said lens,

(d) said circular central portion of said lens containing a light sensitive material in composition with said clear plastic resin, which light sensitive material is operable to change in its light transmissivity when subjected to ambient light such as sunlight passed through said lens when said lens is operatively worn by a person, whereby the amount of light passing through said central portion of said lens into the eye of the wearer of said lens will be less than the light received by said central portion of said lens.

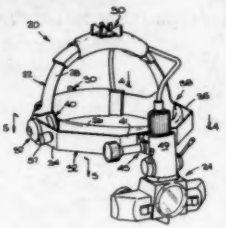
4,681,413

HEADBAND WITH OPTICAL DEVICE ADJUSTABLY COUPLED THERETO

Otto H. Schmidt; Helmut A. Heine, both of Herrsching, and Helmut Rosenbusch, Weilheim, all of Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Heine Optotecnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 698,362
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—205 **33 Claims**

1. Head-worn apparatus comprising a headband, a medical optical device, a moveable bow-like support having opposed ends each of which is coupled to the headband and a central region to which the optical device is coupled, means coupling the opposed ends of the support to the headband for pivoting the support and with it the optical device about a pivot axis between a first position relative to the headband and a second position relative to the headband, and means for automatically locking the support in at least one of the first and second positions when moved thereto, the locking means including



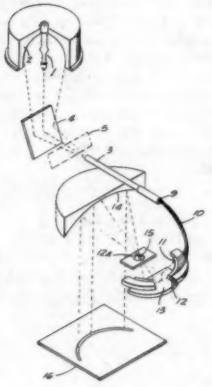
means coupled to a first end of the support and pivotable with respect to the headband about the pivot axis and means fixed with respect to the headband disposed adjacent the first end of the support, the means pivotable with respect to the headband and the means fixed with respect to the headband cooperating to engage each other and automatically lock the support in the respective position when moved thereto.

4,681,414

CONDENSER SYSTEM

Ronald S. Hershel, 4828 Springhill Rd., Albany, Oreg. 97321

Continuation-in-part of Ser. No. 502,486, Jun. 9, 1983, abandoned. This application Jun. 6, 1984, Ser. No. 618,056
Int. Cl.[4] G03B *21/00*
U.S. Cl. 353—102 **45 Claims**

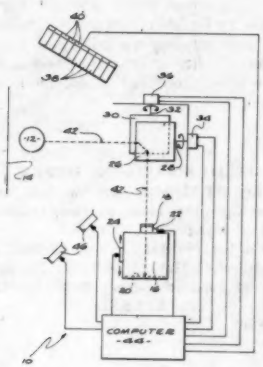


1. A condenser system comprising means for homogenizing light with substantially no change in light cone angle, and substantially no absorption or reflection losses of light; means for channeling light emerging from said homogenizing means into an arc of light spots of substantially equal intensity, said arc having a predetermined radius, width and direction; means for magnifying the width of said arc, for reducing proportionately the cone angle of said arc in the direction of its width to produce circularly symmetric light distribution in the aperture of said condenser; and means for transferring the arc from the magnifying means to an image plane, for focusing the arc at the image plane, and for homogenizing the light along the length of the arc at the image plane.

4,681,415
MULTIPLE IMAGE PHOTOGRAPHY SYSTEM

Rafael Beer, 207 S. Catalina #4, Los Angeles, Calif. 90004, and Tyrone Christiansen, 5617 Hollywood Boulevard, No. 102, Hollywood, Calif. 90028

Filed Nov. 1, 1985, Ser. No. 794,944
Int. Cl.[4] G03B *1/00, 15/00*
U.S. Cl. 354—120 **10 Claims**



10. An apparatus for generating multiple or continuously displaced images on a photograph film, comprising:

a camera having a lens through which optical images may be focused onto the photographic film, the lens defining an optical axis;

a first mirror rotatable around an axis substantially orthogonal to the optical axis of said lens for adjustably reflecting optical images into said lens;

means for controlling the angular position of said first mirror;

a second mirror rotatable around an axis substantially parallel to the optical axis of said lens for adjustably reflecting optical images of an object to be photographed onto said first mirror;

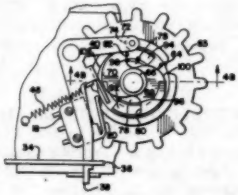
means for controlling the angular position of said second mirror; and

means for exposing the photographic film in accordance with programmed instructions, whereby positionally varying multiple optical images may by projected onto the photographic film for sequentially exposing different parts of the photographic film with the image.

4,681,416
CAMERA SHUTTER COCKING MECHANISM

Klaus Raschke, Schaumburg, Ill., assignor to W. Haking Enterprises Limited, Hong Kong

Filed Feb. 10, 1986, Ser. No. 826,971
Int. Cl.[4] G03B *17/42*
U.S. Cl. 354—173.1 **12 Claims**



1. In a camera having a shutter release system, an electric motor drive system coupled to advance a film and actuate a shutter-cocking system from a released to a cocked condition with each one-frame advance of said film, said shutter-cocking system restoring said shutter release system to a cocked condition responsively to movement of a movable cocking member coupled to be driven by said motor drive system from a released to a shutter-cocking position against the opposing force of at least one energizing spring, said opposing force increasing with the movement of said cocking member from said released to said shutter-cocking position, the improvement comprising:

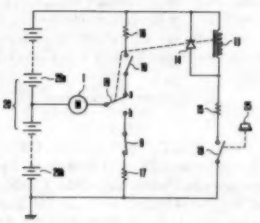
camming means rotatingly driven by said motor drive system and having at least one cam lobe with a contour of varying radius from the axis of rotation thereof;

cam follower means coupled to said cocking member and urged to engagingly follow said cam lobe so as to move said cocking member from said released to said shutter-cocking position against said increasing opposing force, said lobe contour being configured to maintain the load of said shutter cocking system on said motor drive system generally constant throughout film advance.

4,681,417
CAMERA WITH MOTOR-DRIVEN DIAPHRAGM DEVICE

Masahisa Fujino, Tokyo; Hidehiko Fukahori, Kanagawa, and Toshihiko Satoh, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 777,008, Sep. 17, 1985, abandoned, which is a continuation of Ser. No. 617,798, Jun. 6, 1984, abandoned. This application Sep. 16, 1986, Ser. No. 910,277
Claims priority, application Japan, Jun. 13, 1983, 58-105220
Int. Cl.[4] G03B *7/00, 9/08*
U.S. Cl. 354—234.1 **6 Claims**



5. A camera having a drive member arranged to move in response to rotation of an electric motor and diaphragm drive means responsive to one direction of rotation of said motor which moves said drive member in a first direction so that a diaphragm is driven by said movement in an aperture opening direction, and responsive to the direction opposite to said first direction of rotation of said motor which moves said drive member in said opposite direction so that said diaphragm is driven by said movement to move in the aperture closing direction, comprising:

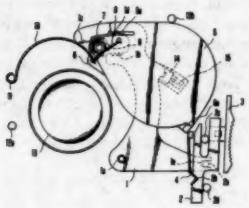
detecting means for detecting a maximum aperture opening state of said diaphragm, said detecting means not detecting the maximum aperture opening state of said diaphragm at a position where the size of the aperture opening of said diaphragm reaches a maximum value by the movement of said drive member in the first direction, said detecting means detecting the maximum aperture opening state of said diaphragm only when said drive member further slightly moves in the same direction from the position where the size of the aperture opening of said diaphragm reaches the maximum value; and

motor control means for stopping said electric motor when the maximum opening state of said diaphragm is detected by the detecting means.

4,681,418
CAMERA

Takanori Kodaira, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1985, Ser. No. 765,330
Claims priority, application Japan, Aug. 23, 1984, 59-175773; Aug. 23, 1984, 59-175774
Int. Cl.[4] G03B 17/02
U.S. Cl. 354—288 37 Claims

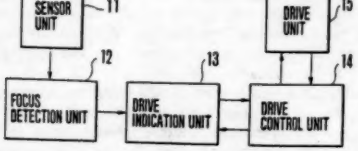


1. A camera comprising:
(a) a protective cover arranged to open and close a front surface of a photo-taking optical system;
(b) an auxiliary optical system arranged to move into and out of a optical path of said photo-taking optical system, said auxiliary optical system being arranged to be operable independently of said protective cover;
(c) operation means arranged to be shiftable between first, second and third states thereof; and
(d) driving means arranged to drive said protective cover to open and close in response to a shift of said operation means between said first and second states thereof and to insert and extract said auxiliary optical system into and out of said optical path in response to a shift of said operation means between said second and third states while having said protective cover kept at a predetermined open position thereof.

4,681,419
AUTOMATIC FOCUSING DEVICE

Shinji Sakai, Tokyo, and Takashi Kawabata, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 448,742, Dec. 10, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,416
Claims priority, application Japan, Dec. 18, 1981, 56-205787; Dec. 18, 1981, 56-205788; Dec. 18, 1981, 56-205790
Int. Cl.[4] G03B 3/10
U.S. Cl. 354—402 6 Claims

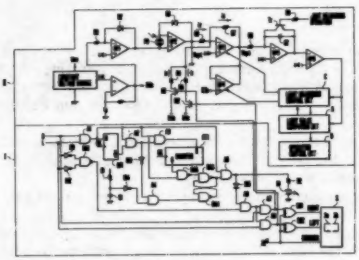


1. A camera system capable of using a variable focal length lens and having an automatic focusing function, comprising:
(a) focus detection means for detecting light coming through a lens and generating a difference signal corresponding to an existing deviation of a real image plane on which an image of an object is being really formed relative to a predetermined focal plane;
(b) driving means for driving lenses;
(c) a signal forming circuit for generating a signal which indicates an amount of shifting of an image plane against an amount of shifting of a lens when the lens is driven by said driving means, said signal from said signal forming circuit varying depending on a zoom state used on the lens, and said signal forming circuit being provided at the lens;
(d) detection means for detecting the shifting of the lens; and
(e) a stopping circuit for accumulating the signal of said signal forming circuit every time said detection means detects that the lens shifts by a unit shifting amount and at the same time stopping the driving of the lens by said driving means when an amount of said accumulation of signal develops a prescribed relationship with said difference signal.

4,681,420
LIGHT MEASURING DEVICE

Yasuo Suda; Kiyoshi Alyfuku; Akio Sunouchi, and Nobuyuki Suzuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 662,257, Oct. 18, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,802
Claims priority, application Japan, Oct. 21, 1983, 58-197336
Int. Cl.[4] G03B 3/00
U.S. Cl. 354—409 25 Claims



8. A light measuring device comprising:
(1) display means including a plurality of display elements arranged on an optical path of light measurement, said display elements being capable of being activated and deactivated;
(2) light measuring means including a light measuring element for measuring a light value;
(3) correcting means responsive to a plurality of activations or deactivations of said display elements of said display means for correcting a light measuring value of said light measuring means to perform plural kinds of corrections in corresponding to amounts of change in said light measuring value by said light measuring means at said plurality of activations of said display elements; and
(4) said display elements of said display means including means for displaying measured distance information.

12. A light measuring device according to claim 8, wherein said display element includes means for selectively presenting "near focus", "in focus" and "far focus" display.

4,681,421
DOUBLE-FACE FLEXIBLE PRINTED CIRCUIT BOARD

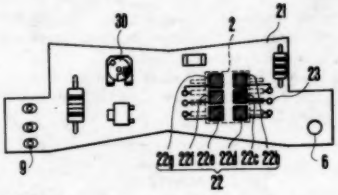
Akira Yamada, Tokyo, and Go Tokura, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 656,172, Sep. 28, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,801
Claims priority, application Japan, Oct. 6, 1983, 58-187271
Int. Cl.[4] G03B 7/00
U.S. Cl. 354—485 11 Claims

1. A double-face flexible printed circuit board to be placed

within a space between an internal mechanism and an outer cover of a camera, comprising:

one side of said printed circuit board having an electrical circuit element of a flat packaged shape disposed therein on a given area; and



another side of said printed circuit board, opposite to said one side, having a pad area of a checking circuit pattern arranged thereon directly opposite the given area.

4,681,422

PAPER SUPPLY DEVICE FOR AN ELECTROSTATIC PHOTOGRAPHIC PRINTER

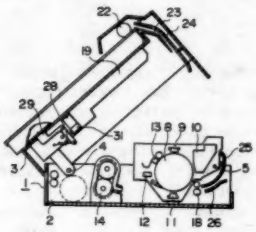
Harutaro Oba; Yasuhiko Ozawa; Yasuyoshi Yamaguchi, all of Shizuoka, and Osamu Mimoto, Kanagawa, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,433

Claims priority, application Japan, Nov. 1, 1984, 59-230773; Nov. 8, 1984, 59-236494; Nov. 12, 1984, 59-237968

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **5 Claims**



1. An electrostatic photographic printer comprising:

(a) a housing, said housing including a base and a cover which are connected for pivotal motion in a vertical plane relative to each other;

(b) a picture image forming means provided at a lower part of said housing, said picture image forming means including at least one photosensitive member on which an electrostatic latent image is to be formed, a toner supplying means, a transfer means, and a fixing means;

(c) a paper supply cassette provided at an upper part of said cover;

(d) a paper supply roller provided at said upper part of said cover for rotation to draw out individual sheets of paper disposed in said paper supply cassette;

(e) a driving means connected to drive said paper supply roller; and

(f) a paper guide for guiding paper from said paper supply roller to said picture image forming means, said paper guide including a first guide plate provided along an inner face of said base and a second guide plate provided along an inner face of said cover in an opposing relationship to said first guide plate, said first and second guide plates being sized, shaped, and positioned so that, when said cover is pivoted away from said base, said second guide plate is widely separated from said first guide plate, facilitating the removal of jammed paper.

4,681,423

COPYING MACHINE HAVING A CONTROL PROCESS TO REDUCE COPYING TIME

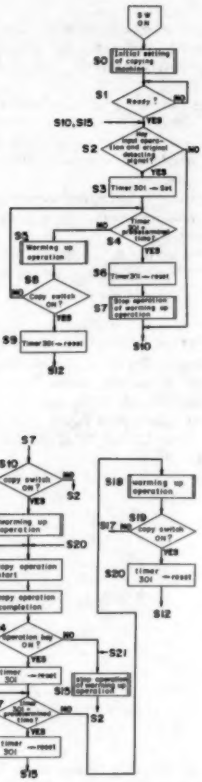
Masaru Nishijima, Hirakata, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

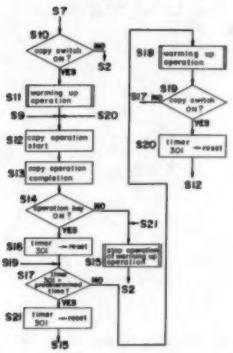
Filed Sep. 12, 1985, Ser. No. 775,307

Claims priority, application Japan, Sep. 14, 1984, 59-193437; Sep. 14, 1984, 59-193438; Sep. 17, 1984, 59-195239

Int. Cl.[4] G03G *15/12*

U.S. Cl. 355—14 R **6 Claims**





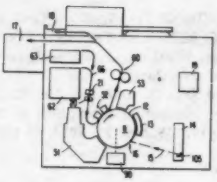
2. An electrophotographic copying machine for making at least one copy of an original located on an original platform, said copying machine comprising means for performing a warming up operation of necessary devices including a photoreceptor drum and fixing device provided in the copying machine, means for performing copying operation in accordance with an operation of a copy switch and control means for performing the said warming up operation in accordance with an order signal generated before the operation of the copy switch, said order signal of the warming up operation is a signal outputted from any one of the keys for setting various information for copying.

4,681,424

COMPENSATION FOR FINE LINE PRINTS

Sherwood Kantor, Boulder; Garry J. Selby, Longmont, and Larry L. Wolfe, Broomfield, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed May 20, 1986, Ser. No. 864,985
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **11 Claims**



1. An apparatus for modifying print data in an electro-photographic printer to compensate for environmental variations which would otherwise result in print quality variations comprising:

means for developing a series of clock pulses of varying phase displacement;

selector means responsive to at least some of said clock pulses and an addressing input for selecting and outputting selected of said pulses;

means responsive to a signal representing said environmental variations for developing an addressing input for said selector means; and

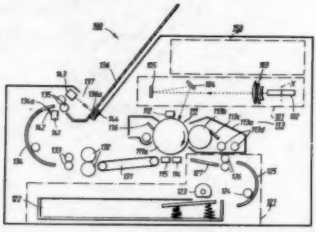
logic means responsive to said print data and to said selected pulses for producing modified print data signals.

4,681,425

IMAGE FORMING APPARATUS

Yasufumi Tanimoto, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 16, 1986, Ser. No. 919,697
Claims priority, application Japan, Oct. 24, 1985, 60-239221
Int. Cl.[4] G03G *15/00, 15/01*
U.S. Cl. 355—14 CU **7 Claims**



1. In an image forming apparatus including a main body having a paper delivery opening, an image forming means in the main body for forming an image on the paper and a receiving tray provided at the paper delivery opening to receive the paper delivered from the paper delivery opening, the improvement comprising:

delivery paper detecting means provided near the paper delivery opening for detecting the passage of the paper delivered and outputting a first signal representing the passage of the paper;

paper presence detecting means for detecting the presence of the paper delivered on the receiving tray and outputting a second signal representing the presence of the paper;

count means for counting the number of the paper delivered on the receiving tray upon the first and second signals and outputting a third signal representing the number of the paper delivered;

memory means for storing a delivery quantity limit value and outputting a fourth signal representing the number of the paper corresponding to the delivery quantity limit value;

comparing means for comparing the third signal with the fourth signal and outputting the coincidence signal when the two signals coincide; and

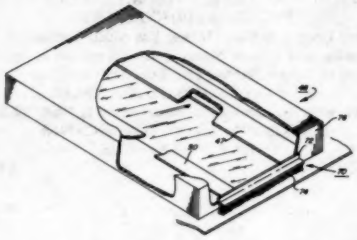
operation halt means for halting the image forming means in response to the coincidence signal from the comparing means.

4,681,426

BRUSH END SEALS FOR BLADE CLEANER HOUSING

Lloyd F. Bean, Rochester; Richard L. Forbes, II, Pittsford; Joseph A. Swift, Ontario, and Bruce E. Thorp, Walworth, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 19, 1986, Ser. No. 864,694
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **12 Claims**



1. In an electrostatographic reproducing apparatus comprising a charge retentive surface movable through an endless path, a cleaner apparatus for removing and collecting residual toner from said charge retentive surface comprising an enclosed cleaner housing including a residual toner sump, a cleaning blade and means to support the blade edge in cleaning engagement with the charge retentive surface and end seals at each end of said charge retentive surface, said end seals comprising a dense fibrous brush of resiliently flexible fibers fixed to a backing, said fibers being oriented in compression interference sealing contact with said charge retentive surface and in sealing engagement with the ends of said cleaning blade to provide a physical containment wall for bulk toner in the cleaner housing and a seal between the wall and the charge retentive surface.

4,681,427

ELECTRONIC PRINTING METHOD

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 730,828, May 6, 1985, Pat. No. 4,610,536. This application Apr. 23, 1986, Ser. No. 854,926
Int. Cl.[4] H04N *1/46;* G03B *33/12*
U.S. Cl. 355—32 **8 Claims**

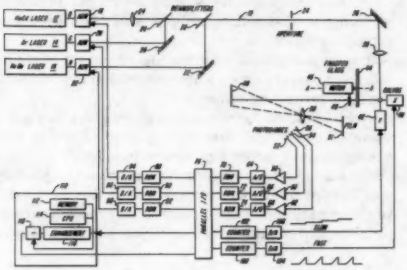
1. A method for electronically printing copies of original pictorials, said method comprising the steps of:

coarsely scanning the original pictorial for lumninance information to establish its tonal properties;

imaging the original pictorial on high-contrast copy material with a well-corrected copy lens;

comparing the original's tonal properties with the sensitometric properties of the high-contrast copy material to generate a correction function for enhancing the tonal

properties of the copy compared with those of the original; and



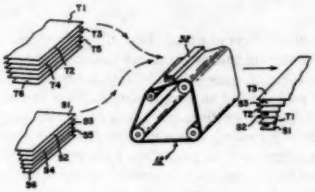
exposing the copy material by coarsely scanning the original with a light source whose intensity is modulated in accordance with said correction function.

4,681,428

APPARATUS FOR PRODUCING INTERLEAVED COPY SHEETS

James M. Devoy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1986, Ser. No. 850,643
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SH **9 Claims**



1. In apparatus including (1) means for selectively presenting copy sheets of either a first characteristic or a second characteristic to an image receiving position and (2) means for sequentially copying a set of originals onto copy sheets presented at the image receiving position; the improvement comprising:

first and second supplies of copy sheets of the first and second characteristics, respectively; and

control means for (1) causing the presenting means to alternately present copy sheets from said first and second supplies to the image receiving position, and (2) causing the copying means to produce copies of successive originals of the set onto successive copy sheets presented to the image receiving position from said first supply.

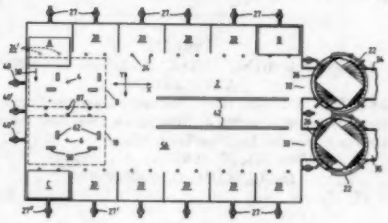
4,681,429

FILM LAMINA HANDLING

Harry A. H. Spence-Bate, Morley, Australia, and Timothy B. Smith, Wickens Manor, England, assignors to Joyce Florence Spence-Bate, Morley, Australia

Filed Apr. 11, 1986, Ser. No. 850,668
Claims priority, application Australia, Apr. 12, 1985, PH0110
Int. Cl.[4] G03B *27/60*
U.S. Cl. 355—73 **9 Claims**

1. In a film lamina storage and handling device having at least one treatment position where the film is treated, the device comprising upper and lower plates defining a transfer area therebetween at least partially enclosing the treatment position, means for maintaining a cushion of gas between the plates and within a periphery of the plates to support a lamina in a plurality of X and Y positions relative to the treatment position and means for moving the lamina relative to the treatment position the improvement wherein said lamina moving means comprises:



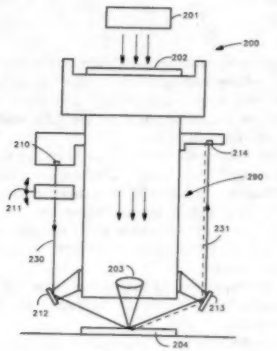
inlet means for supplying gas to said transfer area at a particular pressure and a plurality of controllable outlets selectively communicable with a pressure, outwardly of the periphery, lower than said particular pressure so as to move said lamina with said gas according to a pressure differential.

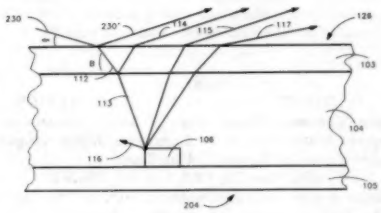
4,681,430

METHOD FOR FOCUSING PROJECTION PRINTER

Atul Goel; Keith G. Bartlett, both of Ft. Collins, Colo., and W. R. Trutna, Atherton, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 27, 1986, Ser. No. 900,662
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **4 Claims**





1. An improved method for automatically focusing an image through a lens onto a surface having reflective and refractive properties, the focusing method of the type wherein a optical transmitter transmits an optical signal toward the surface and

where the optical signal is reflected off the surface to an optical receiver, the optical receiver generating an electronic signal employed to focus the lens, the improvement comprising:

selecting a dye which strongly absorbs light at the wavelength of the optical signal; and

dissolving the dye in the surface.

4,681,431

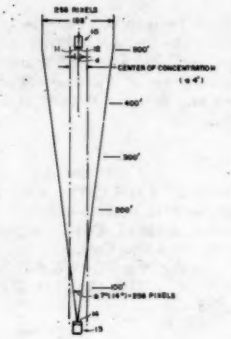
OPTICAL RANGING ANTI-COLLISION TECHNIQUE AND SYSTEM

John C. Sims, deceased, late of Sudbury, Mass. (by Lucille Sims, executrix), and Charles J. Mundo, Jr., Sudbury, Mass., assignors to Sineco, Inc., Sudbury, Mass.

Filed Feb. 27, 1985, Ser. No. 706,193

Int. Cl.[4] G01C *3/08;* **G01P** *3/36*

U.S. Cl. 356—4 **9 Claims**



1. A system for avoiding collision between a first vehicle and a second vehicle each capable of moving along the same general path, said system comprising

at least one means mounted on said first vehicle for emitting optical pulse signals;

detection means mounted on said second vehicle including

optical scanning means, the scanning operation thereof defining a substantially triangular field of scan, said scanning means being responsive during its scanning operation to the optical pulse signals emitted by said at least one emitting means for providing output scanned information;

means responsive to said output scanned information for determining the range between said first and second vehicles,

means responsive to changes in said range determination as a function of time for determining the closing speed between said vehicles, and

alarm means responsive at least to said closing speed determination for permitting evasive action to be taken by said second vehicle when said closing speed exceeds a selected value to avoid collision with said first vehicle.

4,681,432

PHOTO-ELECTRIC CONVERTING DEVICE

Takashi Kawabata; Yuichi Sato; Tokuichi Tsunekawa, and Susumu Matsumura, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,242

Claims priority, application Japan, Apr. 1, 1983, 58-57208; Jul. 12, 1983, 58-126332; Jul. 12, 1983, 58-126333

Int. Cl.[4] G01C *3/08;* **G03B** *3/00, 3/18;* **H01J** *40/14*

U.S. Cl. 356—4 **4 Claims**

1. An information signal processing device for a focus detection device for intermittently projecting a light bundle to an object from light projecting means and detecting light reflected from the object at a time of the light projection, thereby detecting a focusing state or a distance state, comprising:

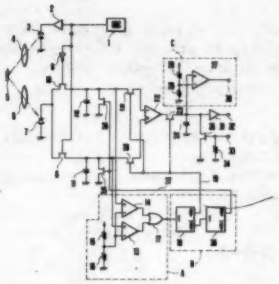
(a) a light receiving part for receiving light from the object;

(b) first storing means for storing an output of the light receiving part at a time of light projection by the light projecting means;

(c) second storing means for storing an output of the light receiving part at a time no light projection is performed by the light projecting means;

(d) detecting means for producing an output when a stored value of either said first storing means or said second storing means reaches a predetermined level;

(e) third storing means for forming a signal corresponding to a difference signal between the stored values of the first storing means and of the second storing means in response to the output of said detecting means, and for storing said



signal corresponding to the difference signal every time the detecting means produces said output; and

(f) initialization means for shifting the stored values of said first and second storing means to their initial state for a short period of time in response to the output of said detecting means, whereby said first and second storing means store the output of the light receiving part from an initial stage until said output from the detecting means is produced, and repeat said storing operation every time said output from the detecting means is produced, and at the same time every time the detecting means produces an output, the difference signal of the values stored by said first and second storing means is stored by said third storing means, thus such information as corresponding to the light reflected from the object due to said light projection is obtained as a stored value of said third storing means.

4,681,433

METHOD AND APPARATUS FOR MEASURING RELATIVE POSITION

Heinz Aeschlimann, Aarau, Switzerland, assignor to Kern & Co. AG., Aarau, Switzerland

Continuation-in-part of Ser. No. 57,194, Jul. 13, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,685

Claims priority, application Switzerland, Jul. 20, 1978, 7819/78

Int. Cl.[4] G01C *3/08;* **G01B** *11/26*

U.S. Cl. 356—5 **6 Claims**

1. A surveying apparatus for measuring the relative position of a first point and at least one second point with

(a) means (15) at the first point for directional transmission to the second point of modulated electromagnetic waves with a wavelength between 100 um and 0,1 um;

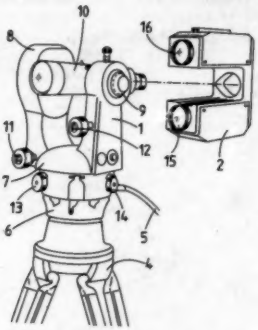
(b) means (15') at the second points to beam back to the first point said modulated waves;

(c) means (2) at the first point to obtain from the transmitted and returned waves the distance to the second point;

(d) means (2) for transmission, by means of modulated electromagnetic waves, of signals representing distance between the points, wherein the improvement comprises:

(e) means (3, 17) at each second point for digitally storing measured numerical values of said distance and combining these values with additional numerical or alphanumerical information concerning respectively each second point;

(f) means for separate transmission of signals representing distance or directional information between the points by



means of electromagnetic waves with a wavelength between 5 m and 15 m; and

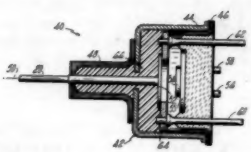
(g) a separate data storage means coordinated with each of the second points, this storage means being activated for storage of the signals representing distance or directional information and transmitted separately, by reception of said waves serving for distance measurement and being directed from the first point to the second point corresponding to the respective storage means.

4,681,434

DUAL SPECTRA OPTICAL PYROMETER HAVING A SERIAL ARRAY OF PHOTODETECTORS

Dean A. Keppler, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 14, 1985, Ser. No. 798,213
Int. Cl.[4] G01J 5/18
U.S. Cl. 356—45 **3 Claims**



1. A dual spectra optical pyrometer having a serial array photodetector module for measuring the temperature of a remote target, comprising:

optical guide means for receiving from the target an optical beam having a spectral width and having an emitted component from the target and a reflected component from a fireball having a temperature,

housing means adapted to receive said optical guide,

first photodetector means contained within said housing means absorbing from said target optical beam a first optical component having a spectral width selected to be a portion of the target beam spectral width and passing therethrough an optical beam remainder, said first detector means providing an electrical signal equivalent of said first optical component,

second photodetector means contained within said housing means receiving said optical beam remainder and providing a second electrical signal equivalent thereof,

signal processing means receiving said first and second detector signals and further receiving signals indicative of said first component spectral width and an estimate of said fireball equivalent black body temperature, said signal processing means

generating from said first photodetector signal a temperature signal indicative of an equivalent black body temperature,

generating from said second photodetector signal a temperature signal indicative of an equivalent black body temperature,

generating from the difference of said first temperature signal and said second temperature signal a temperature correction signal in dependence on said estimated fireball equivalent black body temperature signal and said first component spectral width signal,

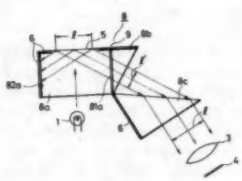
providing a corrected temperature signal from the difference between said first temperature signal and said temperature correction signal.

4,681,435

CONTACT PATTERN OBSERVATION APPARATUS

Kazuhisa Kubota, and Shigekazu Yasuda, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 30, 1984, Ser. No. 595,339
Claims priority, application Japan, Mar. 31, 1983, 58-47435[U]
Int. Cl.[4] G06K 9/20
U.S. Cl. 356—71 **3 Claims**



1. An object contact pattern observation apparatus comprising:

a transparent body comprising a prism, including a rectangular prism piece and a first triangular prism piece, said rectangular prism piece and said first triangular piece having respective mutually parallel planar surfaces extending substantially coextensively and being separated by an air gap, said air gap being provided to prevent ambient light entering said rectangular prism piece through a substantially planar detection portion from being transmitted into said first triangular prism piece; said rectangular prism piece additionally having a first surface and a second surface and said substantially planar detection portion being located on said first surface, a light absorbing portion located where light totally reflected at said detection portion is introduced to said light absorbing portion with said light absorbing portion including said second surface of said rectangular prism piece; a source for radiating light through said rectangular prism piece to said detection portion to form a visible contact image of a contact pattern of an object placed in substantial contact with said detection portion, said visible contact image appearing to be superimposed on said light absorbing portion and being transmitted from said rectangular prism piece to said first triangular prism piece and said image emerging from said first triangular prism piece in a reduced size with respect

to the actual area of the substantial contact between the object and said detection portion; and

a second triangular prism piece for receiving and restoring said visible contact image to the size of the actual area of the substantial contact between the object and said detection portion said restored image emerging from said second triangular prism piece for observation.

4,681,436

FEMTOSECOND LASER PULSE MEASURING SYSTEM

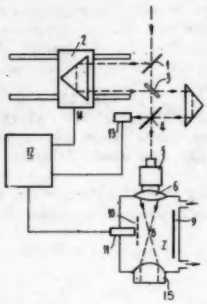
Neng H. Ching, 5 Yasmar Avenue Haberfield 2045; Ralph G. Marson, 37 Mittabah Road Hornsby 2077, both of Sydney NSW; Michael J. Norman, Ursula College ANU, Canberra City 2601 ACT, and John L. Hughes, 38 Basedow Street, Torrens, Canberra ACT 2607, all of Australia

Filed Feb. 28, 1985, Ser. No. 706,590

Claims priority, application Australia, Feb. 28, 1984, PG3822

Int. Cl.[4] G01J *1/04, 1/42*

U.S. Cl. 356—121 **15 Claims**



1. Apparatus for measuring the profile of a single laser pulse to an accuracy of a femtosecond, in the pulse duration range of one nanosecond to one femtosecond, comprising:

means for diverting a portion of said single pulse;

means for splitting the diverted portion into N split portions, N being an integer greater than one;

means for splitting each of said N portions into first and second components;

means for independently delaying each of said first and second components of each of said N portions, and for adjusting the delayed first and second components of each of said N portions so that the delayed first and second components of said N portions are overlapped to varying degrees;

means for expanding the delayed first and second components of each of said N portions;

means for focusing the expanded first and second components of each of said N portions;

interaction chamber means containing a low pressure gas, for ionizing said gas with the focused first and second components of each of said N portions, said interaction chamber means having exit window means through which the first and second components of each of said N portions exit;

ion detector means, coupled to said interaction chamber means, for detecting the ions produced by the focused first and second components of each of said N portions and outputting electrical signals corresponding respectively thereto;

processing means for receiving the electrical signals from said ion detector means;

energy detector means for receiving the first and second components of each of said N portions exiting said exit window means of said interaction chamber means, and for providing output signals corresponding to a pulse duration and a total energy of each of said N portions; and

monitor means for receiving said output signals and providing a display of the envelope and duration of said single laser pulse.

4,681,437

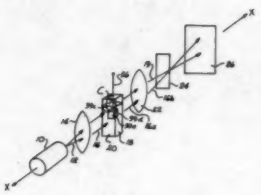
LASER SCHLIEREN CRYSTAL MONITOR

Robert B. Owen, and Mary H. Johnston, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 28, 1985, Ser. No. 706,565

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—129 **10 Claims**



1. A method for monitoring the state of a crystal to determine whether or not the crystal is growing or dissolving in a solution comprising the steps of:

emitting a light beam from a light source;

collimating said emitted light beam into a first collimated light beam of parallel light rays;

passing said first collimated light beam through said solution in which said crystal is undergoing a change of state so that a first number of the parallel rays in said first collimated beam are deflected in the form of a deflected light beam according to the density gradient of the solution surrounding said crystal;

passing a remaining number of said parallel rays of said collimated beam through said solution in the form of a second collimated beam;

focusing said deflected beam and said second collimated beam at a desired focal point;

disposing a knife edge at said focal point of said focused, deflected beam and said second collimated beam;

passing said second collimated beam past said knife edge to project an image of said crystal upon a screen;

passing a portion of said deflected beam past said knife edge to project a band onto said screen at one end of said crystal image which indicates the growth or dissolution state of said crystal surface being monitored.

4,681,438

AUTOMATIC COMPENSATOR FOR COMPENSATING COLLIMATION ERROR DUE TO TWO-DIRECTIONAL INCLINATION IN SURVEYING INSTRUMENTS

Kenji Kaneko, Higashiyamato, Japan, assignor to Asahi Precision Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1985, Ser. No. 807,470

Claims priority, application Japan, Dec. 18, 1984, 59-191865[U]

Int. Cl.[4] G01C *1/06*

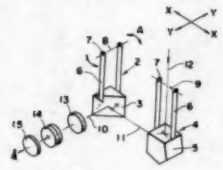
U.S. Cl. 356—143 **4 Claims**

1. An automatic compensator for compensating a collimation error due to a two-directional inclination in surveying instruments comprising:

a first pendulum suspended in the instrument body interior;

a second pendulum also suspended in the instrument body interior and ahead and sidewise of said first pendulum for swinging in directions perpendicular to said first pendulum;

a first reflector mounted on said first pendulum at the lower end thereof and having a reflecting surface for reflecting light incident in the direction of a collimation axis parallel to the axis of swinging of said first pendulum in a direction of a substantially horizontal collimation axis lying in the plane of swinging of said first pendulum; and



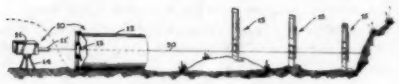
a second reflector mounted on said second pendulum at the lower end thereof and being a double reflecting surface reflector for reflecting light incident in the direction of a collimation axis lying in the plane of swinging of said first pendulum in the direction of a vertical collimation axis.

4,681,439

PIPE LAYING METHOD AND APPARATUS

Jack W. Shoemaker, 9430 Woodsboro Pike, Walkersville, Md. 21793

Filed Oct. 28, 1985, Ser. No. 791,871
Int. Cl.[4] G01B 11/26
U.S. Cl. 356—154 **12 Claims**



1. An apparatus in combination with an adjustable laser beam generating device and a representative section of pipe, wherein the apparatus is used to establish a visual reference for the operator of excavating equipment of the amount of additional excavation needed to meet the grade requirements for laying a pipe string wherein the apparatus comprises:

a centerline target unit comprising a stationary target element surrounded by a rigid housing member having a plurality of spaced leg members wherein at least one of the plurality of leg members is provided with an axially extensible element, whereby the stationary target unit may be releasably received within representative sections of pipe having diameters within a given range; and,

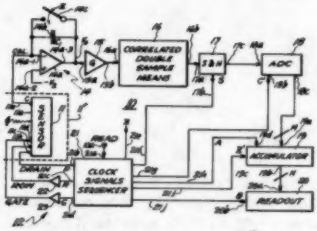
a grade checker unit comprising an elongated generally rectangular open framework element, having an adjustable target element mounted for relative movement with respect thereto, and a generally horizontally disposed foot portion on the bottom surface of the framework element; wherein the vertical sides of said framework member are provided with indicia representative of length, whereby the relative distance between the adjustable target element and the bottom of the framework member may be accurately determined.

4,681,440

HIGH-SENSITIVITY CID PHOTOMETER/RADIOMETER

Hubert K. Burke, Scotia, and Gerald J. Michon, Waterford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,068
Int. Cl.[4] G01J 1/44; H01L 27/14
U.S. Cl. 356—218 **26 Claims**



1. Apparatus for sensing at least the amplitude of incident optical radiation, comprising:

a charge-injection device (CID) sensor having a single pixel, including (1) a drain potential well delimiting a photon-responsive area from which charge carriers, formed responsive to impingent photons of said optical radiation, can be collected, (2) a column potential well in which said carriers are collected, (3) a row potential well, and (4) a gate electrode positioned between said drain well and said column and row wells for respectively connecting and disconnecting said drain well and said column potential well responsive to respective first and second states of a gate signal to respectively allow and prevent removal of said charge carriers to said drain well from at least said column well;

means for reducing the operating temperature of said CID sensor;

sequencer means for first permanently removing charge carriers from said column and row potential wells at least via said drain well, in a charge removal time interval at the commencement of each of at least one optical radiation sensing time interval, and for then causing, for a predetermined number, on the order of 10,000, of cycles in each sensing time interval, charge carriers present in said column and row wells during each of said cycles to repeatedly and non-destructively move between said column and row wells in a predetermined manner; and

means for converting a charge current, resulting from each of said charge carrier movement cycles, to a human-viewable display of the amplitude of said optical radiation incident upon said sensor, with a sensitivity of at least 10E-14 Watts/cm^2, and comprising:

(a) charge amplifier means for converting the charge current to the amplitude of a signal representative of the total charge then in said sensor pixel;

(b) correlated double sampling means for providing an output signal in which is cancelled from the amplitude thereof contributions by portions of the total charge in said pixel not responsive to photons of said incident optical radiation; and

(c) means for accumulating the amplitude of the correlated double sampling means output signal to provide, responsive to the completion of said predetermined number of charge movement cycles, said amplitude display.

4,681,441

LIGHT MEASURING DEVICE

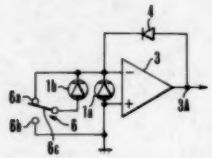
Masanori Uchidoi, Tokyo, and Nobuyuki Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 529,966, Sep. 7, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 834,492

Claims priority, application Japan, Sep. 8, 1982, 57-157161

Int. Cl.[4] G01J *1/44*

U.S. Cl. 356—222 **15 Claims**



1. A light measuring device having a plurality of light sensitive elements and being arranged to selectively detect the outputs of said light sensitive elements, comprising:

means for short-circuiting both terminals of the light sensitive element which is not required for detection in a light measuring mode selected out of different light measuring modes.

4,681,442

METHOD FOR SURFACE TESTING

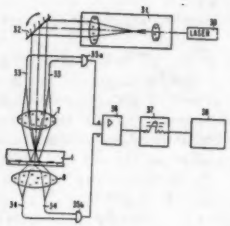
Dietmar Wagner, Gärtringen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1985, Ser. No. 713,077

Claims priority, application European Pat. Off., May 14, 1984, 84105425.7

Int. Cl.[4] G01N *2/88*

U.S. Cl. 356—237 **8 Claims**



1. A method of testing surfaces of transparent objects for the presence of defects thereon comprising the steps of:

impinging light on a surface of an object to be tested at an angle to the surface,

said light being partially reflected as a first light beam by the surface, and partially transmitted as a second light beam through the object, and partially scattered by defects on the surface, said scattered light being both partially reflected as a third light beam and partially transmitted as a fourth light beam through the object,

collecting and recording the first and third light beams,

collecting and recording the second and fourth light beams, and

processing the recorded second and fourth light beams and the recorded first and third light beams and detecting the differences therebetween to locate the defects on the surface.

4,681,443

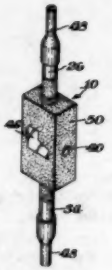
OPTICAL DETECTOR CELL

David T. Bach; Roger A. Gruenke, both of Wilmington, Del., and Herman W. Levin, Philadelphia, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 8, 1985, Ser. No. 731,780

Int. Cl.[4] G01N *1/10*

U.S. Cl. 356—246 **12 Claims**



1. In an optical detector cell for effecting measurements on a liquid, the cell having a measuring chamber for holding the liquid, a first access port for the chamber, a first pair of entrance and exit optical walls lying along a first optical path through the chamber for accommodating the passage of radiation through the chamber, a second pair of optical walls lying along a second optical path transverse to the first path, the improvement for also effecting nephelometric and fluorescence measurements on a liquid in the cell wherein the chamber:

is L-shaped with the first optical path lying along the horizontal leg of the L and the exit optical wall is adjacent the upright leg of the L,

a second pair of walls are sized to permit the passage of radiation through substantially all of the L-shaped chamber,

the exit one of first pair of walls being sized to permit the passage of radiation from substantially all of the vertical leg of the L, whereby the fluorescent volume of the chamber capable of passing through the first exit wall is larger than the volume of the chamber lying on the first optical path.

4,681,444

AUTOMATIC WAVELENGTH CALIBRATION APPARATUS

Alan C. Ferber, Hillside, Ill., and Morteza M. Chamran, deceased, late of Elmhurst, Ill. (by Delories M. Chamran, legal representative), assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

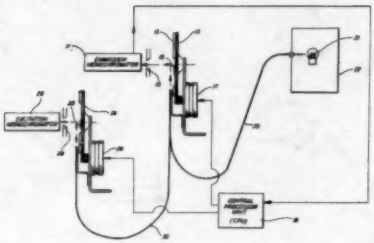
Filed Sep. 14, 1984, Ser. No. 651,187

Int. Cl.[4] G01N *21/64*; G01J *3/10*

U.S. Cl. 356—318 **28 Claims**

16. An automatic wavelength calibration subassembly in a spectrophotometer comprising a monochromator with inlet and outlet slits and wavelength drive means, an emission line source for emitting a reference line of known wavelength, an optic fiber assembly for selectively conducting radiation from said line source to the inlet slit of said monochromator, selectively operable filter means for filtering radiation entering said inlet slit of said monochromator, said filter means having a plurality of filter elements each being selectively positionable adjacent said inlet slit and a selectively positionable reflector means for alternately reflecting radiation from said outlet end of said optic fiber assembly to said inlet slit of said monochromator during wavelength calibration, photometric detector means at said outlet slit, and computer means for controlling

said monochromator including means for controlling said wavelength drive means through a series of scans to center said



wavelength drive means at the peak of said reference line to calibrate said monochromator with said reference line.

4,681,445

INTERFEROMETER

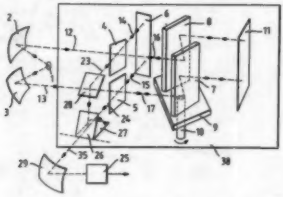
Charles V. Perkins, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,631

Claims priority, application United Kingdom, Jul. 18, 1984, 8418308; Feb. 27, 1985, 8505069

Int. Cl.[4] G01J *3/45*

U.S. Cl. 356—346 **20 Claims**



1. An interferometer comprising a radiation source, a plurality of beam splitters, each of said plurality of beam splitters functioning in a different part of the spectrum of said radiation source, radiation directing means for guiding an input beam of radiation from said radiation source through one of said beam splitters to produce two subbeams which traverse separated paths before returning to said one beam splitter to form a recombined beam, and means for varying the difference in path length of said two subbeam paths, characterised in that said plurality of beam splitters are in fixed locations, and in that said radiation directing means is effective to pass said recombined beam from said one of said beam splitters to an output.

4,681,446

PHASE CONJUGATE FIBER GYROSCOPE

Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 11, 1984, Ser. No. 619,255

Int. Cl.[4] G01C *19/64;* **G01B** *9/02*

U.S. Cl. 356—350 **12 Claims**

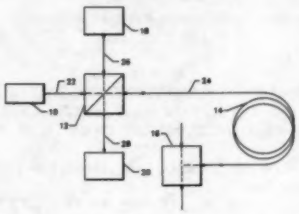
1. An optical fiber rotation sensor, comprising:

an optical fiber coil;

a source of coherent electromagnetic energy;

a beam splitter for dividing the energy into a first beam coupled into a first end of the coil, such that the first beam propagates through the coil from the first end to a second end of the coil, and a second beam;

a scalar phase conjugate reflector for reflecting the first beam at the second end of the coil such that the reflected beam propagates back through the coil to the first end; and



a detector for measuring the phase difference between the reflected beam and the second beam.

4,681,447

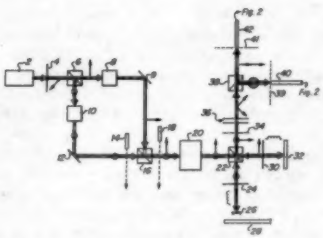
INTERFEROMETER APPARATUS AND METHOD FOR DETERMINING THE SPATIAL RELATIONSHIP OF TWO OR MORE OBJECTS

Robert J. Davidson, Boise, Id., assignor to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 591,100, Mar. 16, 1984, abandoned. This application Aug. 26, 1986, Ser. No. 900,266

Int. Cl.[4] G01B *9/02, 11/02*

U.S. Cl. 356—351 **2 Claims**



1. Interferometer apparatus for simultaneously deriving optical properties respectively representative of the spatial relationship betweeen two observed moving objects having a time varying spatial relationship and determining the spatial relationship of the observed moving objects with respect to each other, comprising;

(1) means for producing a beam of radiation having two components each having a characteristic frequency and polarization;

(2) means for directing one component of said beam upon said two moving objects whose spatial relationship is to be determined and for directing the other component of said beam upon a reference surface to derive individual optical reflections of said two moving objects and an optical reflection from said reference surface;

(3) means for interacting said individual optical reflections of said two moving objects with the optical reflection from said reference surface and forming two separate identical optical images having the same beat frequencies;

(4) means for directing at least a portion of one of said identical optical images containing an image of one of said objects into a first optical path and for directing at least a portion of the other of said identical optical images containing an image of the other of said objects into a second optical path;

(5) means for converting a phase shift between the beat frequencies of said optical images in said first optical path and said second optical path into electrical signals;

(6) means for electrically combining said electrical signals to derive a voltage representative or the phase difference between the beat frequencies of said optical images; and

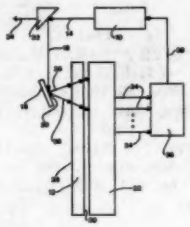
(7) means utilizing said voltage to provide an indication of the spatial relationship between said two movable objects.

4,681,448

METHOD AND APPARATUS FOR STABILIZING ANGLE OF ACCEPTANCE OF MULTIPLE-BEAM INTERFEROMETER MEANS IN OPTICAL MEASURING SYSTEM

Ronald D. Wertz, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Mar. 25, 1985, Ser. No. 715,825
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—352 **13 Claims**



1. In an optical measuring assembly which includes optical radiation emitting means for providing radiation of a first wavelength and a multiple-beam interferometer means, an apparatus for stabilizing the operative angle of acceptance of the interferometer means about a desired value therefor, comprising:

a means for detecting deviations of said operative angle of acceptance from said desired value therefor, said detecting means including said multiple-beam interferometer means which substantially limits transmission of radiation emitted from said emitting means to that radiation encountering said multiple-beam interferometer means at substantially a particular angle of incidence; and

a means, operatively associated with said detecting means, for varying the wavelength of optical radiation emitted by said emitting means from said first wavelength to a second wavelength, said second wavelength having a value such that said operative angle of acceptance is stabilized about said desired value therefor.

4,681,449

HIGH SPEED TESTING OF ELECTRONIC CIRCUITS BY ELECTRO-OPTIC SAMPLING

David M. Bloom, and Brian H. Kolner, both of Menlo Park, Calif., assignors to Stanford University, Stanford, Calif.

Filed Sep. 7, 1984, Ser. No. 648,456
Int. Cl.[4] G01J *4/00*
U.S. Cl. 356—364 **20 Claims**

1. A method of testing an electronic circuit including a transmission line on a substrate of semiconductor material exhibiting linear electro-optic effect comprising the steps of

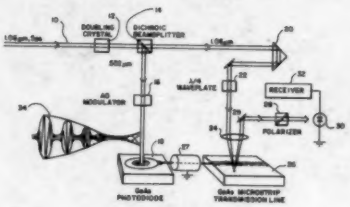
generating an electrical signal,

transmitting said electrical signal to said transmission line,

applying a circularly polarized optical wave perpendicular to said transmission line whereby a longitudinal electrical field component from said transmission line created by said electrical signal and parallel to said optical wave distorts the polarization of said polarized optical wave,

receiving a reflection of said polarized optical wave,

passing said reflection of said polarized optical wave through an analyzer/discriminator, and



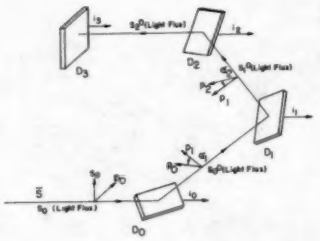
measuring said reflection of said polarized optical wave after passing through said analyzed/discriminator.

4,681,450

PHOTODETECTOR ARRANGEMENT FOR MEASURING THE STATE OF POLARIZATION OF LIGHT

Rasheed M. A. Azzam, New Orleans, La., assignor to Research Corporation, New York, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,611
Int. Cl.[4] G01J *4/04*
U.S. Cl. 356—367 **10 Claims**



1. A photopolarimeter for measuring the state of polarization of a light beam, comprising:

a. a first photodetector, having a partially specularly reflecting surface on which the light beam is incident at an oblique angle with a first plane of incidence and is partially reflected therefrom, said first photodetector producing a first electrical output signal having a magnitude proportional to the radiation absorbed by the first photodetector;

b. a second photodetector, having a partially specularly reflecting surface on which the light beam partially reflected from the first photodetector is incident at an oblique angle with a second plane of incidence, different from said first plane of incidence, and is partially reflected therefrom, said second photodetector producing a second electrical output signal having a magnitude proportional to the radiation absorbed by the second photodetector;

c. a third photodetector, having a partially specularly reflecting surface on which the light beam partially reflected from the second photodetector is incident at an oblique angle with a third plane of incidence, different from said second plane of incidence, and is partially reflected therefrom, said third photodetector producing a third electrical output signal having a magnitude proportional to the radiation absorbed by the third photodetector; and

d. a fourth photodetector having a substantially totally light absorptive surface on which the light beam partially reflected from the third photodetector is incident, said fourth photodetector producing a fourth electrical output

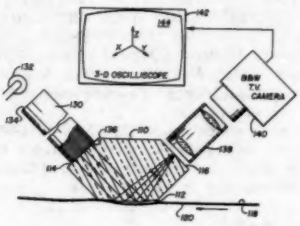
signal having a magnitude proportional to the radiation absorbed by the fourth photodetector.

4,681,451

OPTICAL PROXIMITY IMAGING METHOD AND APPARATUS

John M. Guerra, and William T. Plummer, both of Concord, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 28, 1986, Ser. No. 834,532
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—373 **20 Claims**



10. Apparatus for displaying variations in proximity between a given surface of a transmissive body and another surface, said apparatus comprising:

an optically transmissive body having a reflecting surface and a pair of angularly disposed planar surfaces between which said reflecting surface is located with one of said planar surfaces being a light energy entrance surface and the other a light energy exit surface, said planar surface being oriented so that light energy introduced at said planar entrance surface is normally reflected totally from the interior of said reflecting surface to said planar exit surface so that a light pattern of variable intensity emerges from said planar exit surface due to the frustration of total internal reflection from said reflecting surface as said reflecting surface is brought sufficiently proximate another surface;

means for displaying an observable image of said light pattern such that variations in the denisty of the image of the said light pattern represent proximity variations between said other surface and said reflecting surface; and

means for resolving variations of gray scale density in said image of said light pattern to obtain the variations of proximity between said reflecting surface and said other surface.

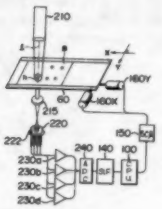
4,681,452

CONTROL SYSTEM FOR AUTOMATIC ELECTRONIC-PART MOUNTER

Kenichi Watanabe, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of, Japan

Filed Nov. 4, 1985, Ser. No. 794,379
Claims priority, application Japan, Nov. 5, 1984, 59-231287
Int. Cl.[4] G01B *11/14*; G06F *15/46*
U.S. Cl. 356—375 **24 Claims**

1. In an automatic electronic part mounter using a sensor for detecting the position of part-mounting sections on a circuit board, the improvement comprising memory means for storing data for correction of the part-mounting section positions, produced by said sensor, wherein, a process of obtaining said data for subsequent process of mounting the part are each



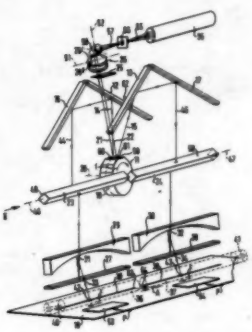
separately performed collectively and continuously for a predetermined number of part-mounting sections.

4,681,453

OPTOELECTRONIC COMPARISON APPARATUS FOR STRUCTURES ON PLANE SURFACES OR FOR PLANAR STRUCTURES

Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,618
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446354
Int. Cl.[4] G01N *21/88*; H05K *3/22*; G01R *31/28*
U.S. Cl. 356—394 **17 Claims**



1. Optoelectronic comparison apparatus for structures on plane surfaces or for planar structures, the apparatus comprising a light source for generating an operational light beam which is split into first and second component beams by an optical displacement device for laterally displacing part of a beam, said component beams impinging on a cyclical light deflecting device displaced in a direction from its axis of rotation, and are directed, after reflection at the light deflecting device, onto first and second points lying on a scanning surface, which scanning surface includes the plane surfaces or planar structures to be compared, wherein the first and second light points form, as a result of the cyclical movement of the light deflecting device, first and second spaced apart, non-overlapping scanning lines, a photoelectric light receiving device for converting light originating from the scanning lines into electrical signals which are representative of the light intensity instantaneously leaving the points, the incident component beams of light impinging obliquely to the axis of rotation onto mirror surfaces of the light deflecting device, first and second mutually crossed, plane, first strip mirrors arranged directly alongside one another in the direction of the light reflected from the light deflecting device, the incident compo-

nent light beams just passing laterally past the first strip mirrors, each receiving only one of the emergent light beams, and deflecting the same into substantially opposite directions where, in each case, further, plane, second strip mirrors are provided which reflect the light to the scanning surface substantially parallel to the emergent light beams entering the first strip mirrors.

4,681,454

DEVICE FOR DETECTING DIFFERENCES IN COLOR

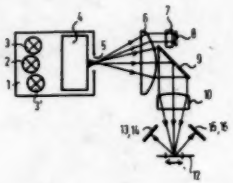
Johannes Breemer, Delft, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed Jan. 29, 1985, Ser. No. 695,950

Claims priority, application Netherlands, Feb. 7, 1984, 8400380

Int. Cl.[4] G01J 3/50

U.S. Cl. 356—402 9 Claims



1. A device for detecting differences in color of a material to be inspected, which comprises:

means for illuminating said material including a first light source emitting light of a first color and a second light source emitting light of a second color;

means for measuring amounts of light reflected by said material;

electronic switching means for alternately energizing at a first rate said first and second light source;

electronic control means responsive to said measured amounts of reflected first light source light and reflected second light source light for controlling intensity of said second light aource whereby measured amounts of reflected first and second light source lights, respectively, have a predetermined ratio;

means for providing second light source signals representing amount of light emitted by said second light source during a measurement;

an optical system for delivering to first and second spaced-apart measuring regions simultaneously a constant portion of said light source being energized, said reflected light measuring means making a first measurement at said first measuring region and subsequently making a second measurement at said second measuring region, said second light source signals providing means comprising means for providing said second light source signals during said first and said second measurements, respectively; and

means to detect a difference between said second light source signals during said first and said second measurements, respectively.

4,681,455

METHOD OF DETERMINING THE AREA COVERAGE OF A PRINTED ORIGINAL OR PRINTING PLATE FOR PRINTING PRESSES

Willi Jeschke, Heidelberg; Helmut Kipphan, Schwetzingen, and Gerhard Löffler, Walldorf, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

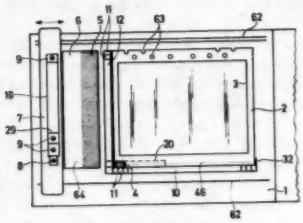
Continuation of Ser. No. 499,212, May 31, 1983, abandoned.

This application Dec. 4, 1985, Ser. No. 805,573

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3309443; May 29, 1982, 3220361

Int. Cl.[4] G01B 11/28

U.S. Cl. 356—445 6 Claims



1. Method of determining area coverage of an original print or printing plate for printing presses by means of a measuring device equipped with a plurality of sensors with which each sensor, respectively, is calibrated with the aid of at least one calibration strip separate from the printing plate yet formed of the same material as that of the printing plate, the calibration strip having a respective minimum and maximum area coverage and having substantially similar surface conditions as those of the printing plate, which comprises performing a further correction calibration specific to the original print and printing plate, respectively, as well as an adjustment by identical correction values of all of the plurality of sensors by means of at least one of the sensors in the measuring device.

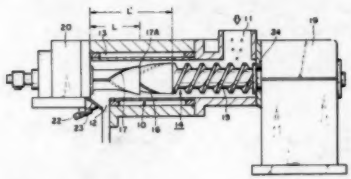
4,681,456

Patent Not Issued For This Number

4,681,457
CONTINUOUS MIXER

Taiji Orimo; Tsugushi Fukui, and Shinichi Fukumizu, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 20, 1985, Ser. No. 778,227
Claims priority, application Japan, May 14, 1985, 60-103192; May 20, 1985, 60-107999
Int. Cl.[4] B01F *7/08*
U.S. Cl. 366—84 **8 Claims**



1. A two-shaft continuous mixer, comprising:

an axially horizontally extending mixing portion having a material supply portion on a first end in an axial direction and a discharge portion on a second end in said axial direction;

first and second rotors each of which comprises a feed screw portion and a mixing blade portion composed of a helical feed blade and a helical return blade, said feed blade and said return blade being disposed in said axial direction and first and second shafts respectively of said first and second rotors being arranged within said mixing portion with said feed screw portion position on a side of said material supply portion so that said first and second shafts are disposed parallel to each other, are disengaged from one another and are rotatable in different directions, such that a terminating end of the feed blade in the mixing blade portion and a beginning end of the return blade are deviated in phase in a circumferential direction on a plane traversing the rotor shaft, wherein an axial length from the discharge end in each rotor to an apex position at which the terminating and beginning ends of said blades are positioned on the plane is 1.3 to 1.6 times the inside diameter of the mixing portion, and wherein said first and second shafts are disposed symmetrically in the mixing portion; and

driving means for rotating the first and second rotors at a uniform speed.

4,681,458
APPARATUS FOR PREPARING ICE CREAM AND THE LIKE

Alfredo Cavalli, Via Galileo Galilei, 9, 20060 Pessano con Bornago (Milan), Italy

Filed Mar. 27, 1986, Ser. No. 844,799
Claims priority, application Italy, Apr. 2, 1985, 21308/85[U]
Int. Cl.[4] A23G *9/00*
U.S. Cl. 366—149 **1 Claim**

1. An apparatus for preparing ice cream and other frozen products, comprising

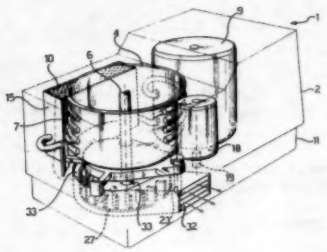
a sealed cabinet having an inlet port and an outlet port;

a substantially cylindrical ice cream freezing vessel supported in said cabinet;

a paddle means rotatably mounted on a drive shaft extending into said freezing vessel;

a motor mounted in said cabinet for rotating said drive shaft paddle means; and

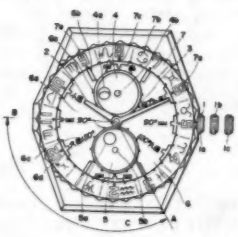
a refrigeration system mounted in said cabinet including an evaporation surrounding said freezing vessel and in thermal contact therewith, a condenser ducted with a substantially parallelepipedic shroud vertically mounted so as to be adjacent said inlet port, a blower rotatably mounted to said drive shaft below said freezing vessel for drawing air from outside cabinet through said inlet port upwardly across said condenser and out from said cabinet through said outlet port.



4,681,459
APPARATUS FOR DISPLAYING ASTROLOGICAL INFORMATION

Takatoshi Nabeyama, Tachikawa, and Eiichi Sakita, Higashikurume, both of, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00665, § 371 Date Jun. 17, 1986, § 102(e) Date Jun. 17, 1986, PCT Pub. No. WO86/03604, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 4, 1985, Ser. No. 881,034
Int. Cl.[4] G04B *19/26*; A63F *1/00*
U.S. Cl. 368—16 **4 Claims**



1. An apparatus for displaying astrological information comprising:

a first display means for displaying information which represents the direction of the sun throughout of the year with respect to a center axis of a watch display surface and is put at regular intervals on the circumference of a circle enclosing said center axis;

a second display means for displaying information which represents the angle difference of directions between the present moon and the sun on a birthday, that is, an aspect, or a fortune corresponding to said aspect is put on the circumference of a circle enclosing said center axis, said

second display means capable of rotating around said center axis relatively to said first display means; and

auxiliary setting means engaging an hour wheel, including train wheels rotating at a predetermined speed, and capable of setting the direction of at least one of the moon and the sun to desired directions by operating a crown.

4,681,460

WORLD TIME WATCH

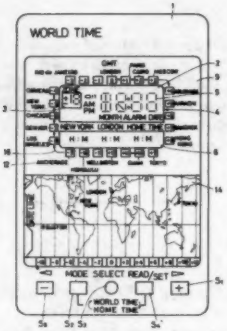
Katsuo Nishimura, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1986, Ser. No. 906,331

Claims priority, application Japan, Sep. 13, 1985, 60-202793; Oct. 15, 1985, 60-229171

Int. Cl.[4] G04B *19/22*

U.S. Cl. 368—21 **5 Claims**



1. A world time watch comprising:

a liquid crystal display device including a time zone display and a time display

the time zone display being provided to display the time difference between a selected place and the Greewich Mean Time;

the time display being provided to display the time of the place corresponding to the time difference displayed in the time zone display;

a printed place name list including a plurality of place names and a plurality of numbers each of which represents the time difference of a corresponding place; and

a printed world map.

4,681,461

ELECTRONIC WATCH WITH OPERATING CONTROLS IN THE BACK COVER OF THE CASE

Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Switzerland

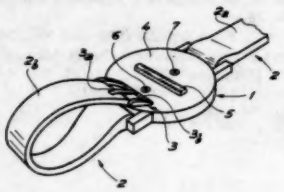
Filed Oct. 16, 1986, Ser. No. 919,394

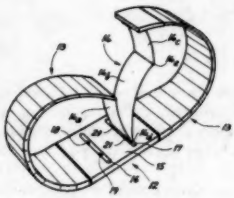
Claims priority, application Switzerland, Oct. 31, 1985, 04692/85

Int. Cl.[4] G04C *17/00, 9/00*

U.S. Cl. 368—69 **17 Claims**

1. An electronic watch including a case having a back cover and at least one control mechanism fixed to said back cover, said back cover having positioning means which determine at least approximately the location at which means external to the case must be placed in order to actuate said control mechanism, and a bracelet having a fastening element, said control mechanism being selected and placed in the back cover in a manner such that at least a portion of said fastening element may be employed as external actuating means therefor and said





positioning means being adapted to accommodate the form and dimensions of said portion of said fastening element.

4,681,462

RECORDING DEVICES

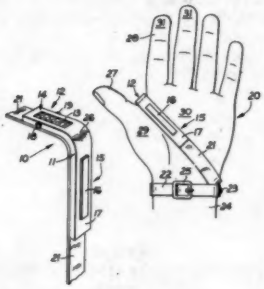
Benjamin Lloyd, 24 Woodbank Drive, Bury, Lancashire, BL8 1DR, Great Britain

Filed Jun. 24, 1985, Ser. No. 748,158

Claims priority, application United Kingdom, Jun. 28, 1984, 8416511

Int. Cl.[4] G04C *17/00;* **A44C** *5/00*

U.S. Cl. 368—69 **4 Claims**



1. In combination with a recording device having a display for displaying information: securing means for securing the recording device to either hand of a user, and an actuator for actuating the recording device and controlling the display, the securing means being so adapted that the actuator is positionable on the palm side of the user's hand enabling it to be actuated by one or more digits of the same hand, and the display is positionable on the backside of the hand, the recording device being adapted to fit between the forefinger and thumb of the user's hand by being flexible in a central region between the display and actuator.

4,681,463

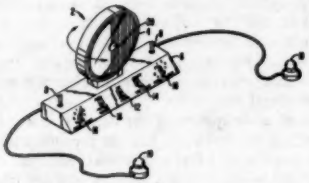
DIFFERENTIAL TIMER

Kurt J. Bendit, 3927 19th St., San Francisco, Calif. 94114

Filed Sep. 12, 1986, Ser. No. 906,856

Int. Cl.[4] G04F *3/00*

U.S. Cl. 368—96 **7 Claims**



1. A device for indicating differential time during game play comprising:

a reversible motor;

means for allocating a time interval between a first move and a second move;

means for selecting between said first and said second move; and

means for displaying said time interval in proportion to said first move and said second move.

4,681,464

TIMEPIECE MOVEMENT INCLUDING A PLURALITY OF STEPPING MOTORS AND AN ELECTRONIC TIME BASE

Claude Ray, Montezillon, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

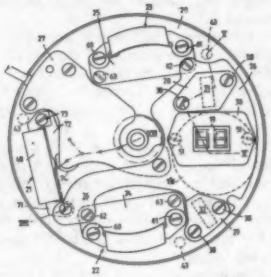
Filed Dec. 4, 1984, Ser. No. 677,969

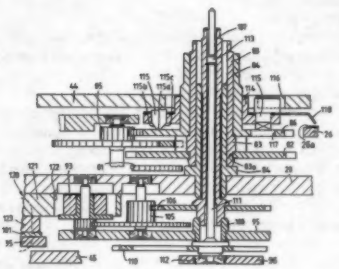
Claims priority, application Switzerland, Dec. 6, 1983, 6515/83

Int. Cl.[4] G04C *3/14*; G04F *8/00*

U.S. Cl. 368—157 **20 Claims**

1. A timepiece movement comprising a frame means, at least two stepping motors, an electronic time base, electronic drive signal forming means controlled by the time base and electrical conducting means transmitting drive signals to said motors, said frame means exhibiting two opposed support surfaces each bearing at least one of said motors with said frame means being between said motors, said electrical conducting means being at least partially constituted by tracks formed on first surfaces of two insulating substrates fixed to said frame means, each of said first surfaces being spaced from and facing a respective one of said support surfaces, said support surfaces being located on the two opposed faces of a baseplate constituting a principal element of the frame means, a guide tube secured in a hole in the baseplate, the outer surface of said tube guiding at least one display wheel train member driven by one of said motors and





the internal surface of said tube guiding at least one display wheel train member driven by another of said motors.

4,681,465

ALARM SIGNALLING ELECTRONIC TIMEPIECE WITH TIMER FUNCTION

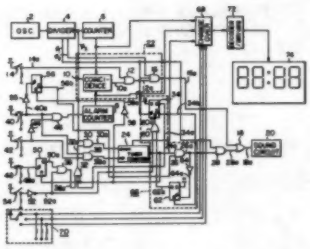
Norihiko Nakamura, Tokyo; Hideki Morishima, Yokohama, and Yoshito Yamaguchi, Saitama, all of Japan, assignors to Rhythm Watch Co. Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,891

Claims priority, application Japan, May 23, 1983, 58-90994; May 25, 1983, 58-93206

Int. Cl.[4] G04B *23/10*

U.S. Cl. 368—246 **3 Claims**



1. An alarm signalling electronic timepiece with a timer function comprising:

an oscillator which generates an oscillating signal;

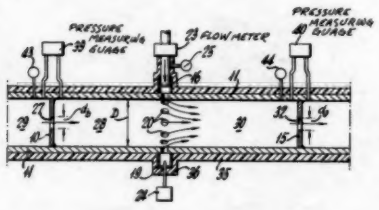
a frequency divider which divides the oscillating signal from said oscillator to produce a clock signal;
a counter which counts up in response to the clock signal form said frequency divider;
an alarming hour counter in which an alarm set hour is memorized;
an alarm signalling circuit which generates an alarm signal upon detecting the identity of the counted values of said counter and said alarming hour counter;
a first alarm circuit which generates a first alarm intermittent signal in response to the alarm signal from said alarm circuit;
a sound circuit which generates alarm sound in response to the first alarm signal sent from said first alarm circuit;
a timer counter for presetting a preset value corresponding to the preset time and counting the clock signal from said frequency divider, and for supplying the first alarm signal to said sound circuit when the counting value reaches to the preset value;
a second alarm circuit which supplies a second alarm signal which is different from said first alarm signal to said sound circuit in response to the alarm signal sent form said timer counter;
a timer switch;
a gate circuit which supplies said clock signal from said frequency divider to said timer counter upon on-operation of said timer switch;
a display change-over switch;
a display change-over circuit to which the count signals from said counter, alarm counter, and timer counter are supplied and which outputs alternatively any one of these count signals in response to the operation of said display change-over switch;
a display circuit which displays the count signal from said display change-over circuit;
a timer start circuit which outputs a timer start signal for supplying the clock signal from said frequency divider to the timer counter when a change of the alarm signal from the alarm circuit is detected and for holding the gate circuit opened until the output of the alarm signal from said timer counter stops;
a timer control switch; and
a timer starting circuit which determines whether to supply the signal from the timer start switch to said gate circuit while stopping the output of the timer start signal from said timer start circuit or to supply the timer start signal from said timer start circuit to the gate circuit while stopping the signal from said timer start switch in response to the operation of the timer control switch.

4,681,466

METHOD FOR DETERMINING QUALITY OF REDUCED QUALITY STEAM

Sze-Foo Chien, Houston; Clifford L. Redus, Katy, and Peter L. Sigwardt, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,812
Int. Cl.[4] G01F *1/34*; G01N *25/60*
U.S. Cl. 374—42 **5 Claims**



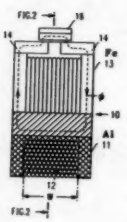
1. In a steam flow line for supplying reduced quality steam to an injection well or the like, a method for determining the quality of said reduced quality steam, comprising;
flowing a supply of quality steam through an aperture in a first flow restriction, and measuring the pressure drop thereacross,
reducing the quality of said steam by mixing a known measured quantity of water with the steam through a peripheral plurality of orifices in said flow line, at a predetermined point downstream of said first restriction,
flowing said reduced quality steam mixture through a second flow restriction, and measuring the pressure drop thereacross, and
determining the quality of the steam at said second restriction as a function of at least the pressure characteristic of the steam at said first and second restrictions and
continuously injecting said quantity of water which is mixed with the steam downstream of the first flow restriction to maintain the reduced quality steam at the second restriction.

4,681,467

IMPACT PRINTING APPLICATIONS

John P. Karidis, Ossining, N.Y., assignor to International Business Machinces Corporation, Armonk, N.Y.

Continuation of Ser. No. 726,206, Apr. 23, 1985, abandoned.
This application Jul. 25, 1986, Ser. No. 887,983
Int. Cl.[4] B41J *3/10*
U.S. Cl. 400—124 **25 Claims**



1. A print actuator comprising:
a stator having a centersection and having at least one slot defined by a plurality of vertically extending poles at a periphery and made from a ferromagnetic material;
a coil disposed about a central portion of said stator centersection, having its axis approximating the axis of said stator, constrained by said vertically extending poles of said stator;
an armature disposed perpendicular to the axis of said coil and extending across said slot between said poles; and
wherein a magnetic flux path extends vertically through one of said poles, transversely through the width of said armature in a direction parallel to the axis of said coil, and vertically through the other of said extending poles.

4,681,468

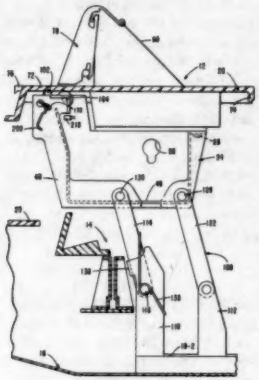
THERMAL PRINTING APPARATUS

Fredrik L. N. Kallin, Kitchener, and Edward R. Evans, St. Clements, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1982, Ser. No. 452,858
Int. Cl.[4] B41J *11/26*
U.S. Cl. 400—120 **12 Claims**

1. A printing apparatus comprising:
a support body;
a printer;
said support body having a first area for storing media to be supplied to said printer and a second area for receiving media from said printer;

mounting means for mounting said printer on said support body to enable said printer to be moved as a unit with said support body; and



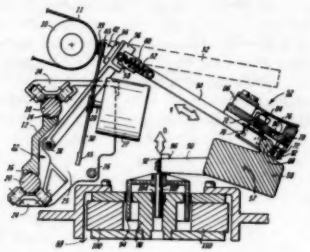
moving means coupled to said support body to enable said support body to be moved from a home position to an accessing position located above said home position where the accessing of media in said support body is facilitated.

4,681,469

QUIET IMPACT PRINTER

Andrew Gabor, Alamo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1985, Ser. No. 751,169
Int. Cl.[4] B41J *9/36*
U.S. Cl. 400—157.2 **8 Claims**



1. An impact printer comprising a platen for supporting an image receptor, a print element having character portions disposed thereon, a print element selector for moving said print element to position a selected character portion at a printing position, a marking ribbon positionable between said print element and said platen and an impact mechanism for delivering a printing force to drive said selected character portion to deform said platen by means of a print tip, said character element and said print tip being supported upon a carriage mounted upon said printer for reciprocating movement in a path substantially parallel to the axis of said platen, said impact mechanism being characterized by comprising:

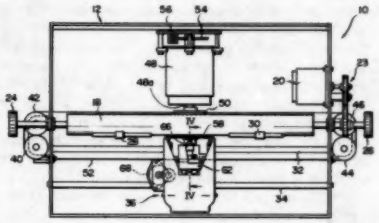
means for moving said print tip including a prime mover and a force multiplier coupling said prime mover and said print tip for imparting to said print tip a force so that said print tip has an effective mass of at least 0.5 pounds and a velocity no greater than 16 inches per second at the location where said character portion initially deforms said platen, and said means for moving applies kinetic energy to move said print tip in a self levelling manner to the point at which said character portion initially deforms said platen.

4,681,470

BIDIRECTIONAL SERIAL PRINTER

Yoshinori Nakajima, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 567,037
Claims priority, application Japan, Jan. 11, 1983, 58-1790
Int. Cl.[4] B41J *19/30*
U.S. Cl. 400—323 **6 Claims**



1. A printer in which input data are once stored in predetermined addresses of a buffer memory and then sequentially read therefrom to be printed out on a sheet, comprising:

data discriminator means for determining whether the input data is predetermined data; and

data sequence changing means for changing a sequence of the input data stored in the buffer memory such that an order of the input data is reversed in response to a result of the determination by said data discriminator means;

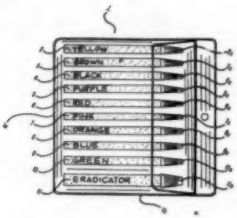
the carriage return code discriminator circuit being constructed to reproduce a back signal if not producing the back signal when the input data is the carriage return data and, if producing, stop delivery of the back signal and deliver a back mode signal.

4,681,471

KIT COMPRISING MULTICOLORED FLUID DISPENSER MARKERS TOGETHER WITH ERADICATING FLUID DISPENSER, STAMPS AND STAMP PAD

Leon Hayduchok, Trenton, N.J., and Leopold Strauss, Forest Hills, N.Y., assignors to All-Mark Corporation, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 519,921, Aug. 3, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 636,080
Int. Cl.[4] B43K *27/00*
U.S. Cl. 401—34 **33 Claims**



1. A coloring kit which comprises in combination:

means comprising a plurality of devices capable of producing a series of rainbow-colored marks or imprints, including at least each of the primary colors red, yellow and blue, each of said devices including a reservoir of a different colored water-based fluid consisting essentially of a common carrier solution composed essentially of 70–100% deionized water and from 0–30% glycols; a non-ionic wetting agent in concentrations of from about 0.125 to 0.25% by weight of said carrier solution; an antioxidant in concentration of from about 0–7% by weight of said carrier solution, and predetermined dyestuffs in concentrations from about 0.125 to 3.25% by weight of said carrier solution;

marking or stamping means operable in collaboration with each said reservoir of colored water-based fluid to produce a discernible colored mark on a smooth substrate;

means comprising a single eradicator fluid formulated to eradicate any and all of the colors of said rainbow-colored marks or imprints produced by said marking devices, said eradicator means comprising a reservoir of a water-based eradicator fluid consisting essentially of about 65–95% of said common carrier solution, about 5–35% reducing agent and about 0.125 to 0.25% wetting agent;

marking or stamping means operable in collaboration with said reservoir of said eradicator to produce an imprint of eradicator fluid on said smooth substrate;

wherein said eradicator fluid is so formulated that upon application to said discernible colored marks said eradicator will remove the color therefrom without removing the color from or substantially staining the substrate.

32. The method of providing a kit comprising a plurality of reservoirs of water-based coloring fluid for different color markings and a reservoir of eradicating fluid which operates to eradicate the colored marks of each of said coloring dispensers, which comprises the steps of:

mixing 70 to 100 weight percent water with 0 to 30 weight percent glycol to form a Solution A; combining said Solution A with a wetting agent in the amount of from 0.125 to 0.25 weight percent of Solution A thereby forming a common carrier solution; and

for each of said coloring fluids:

dissolving a quantity of each of a plurality of appropriately colored dyestuffs in said common carrier solution to form a plurality of colored mixtures and adding a portion of antioxidant to each of said mixtures; and

for said eradicating fluid:

dissolving a quantity of reducing agent in said Solution A in a ratio of from 5 to 35 parts of reducing agent for 95 to 65 parts of Solution A, and adding a wetting agent to said mixture in the amount of from 0.125 of 0.25 weight percent of Solution A.

4,681,472

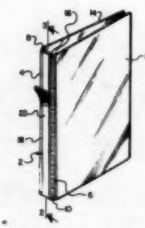
SELF-LOADING BINDER

Paul E. Ruble, 924 Oakmound St., Newbury Park, Calif. 91320

Filed May 2, 1986, Ser. No. 859,005

Int. Cl.[4] B42F *1/00, 1/06;* **B65H** *23/00;* **B42D** *19/00*

U.S. Cl. 402—3 **10 Claims**



1. An improved system for labeling the spine of bound works in combination with a bound material, said bound works comprising a spine with a pair of generally parallel longitudinal edges and a pair of generally parallel transverse edges, and front and back covers attached to the longitudinal edges of the spine, and wherein the improvement comprises:

a transparent cover means attached to the spine adjacent to its longitudinal edges and separated from the spine therebetween, whereby a space is formed between the transparent cover and the spine of the bound work; and

an elongated leader having a lesser width than the space along the spine and adapted to be positioned in that said space between the transparent cover and the spine, said leader when so positioned extending at each end of the spine, one end of the leader being adapted to be removably attached to a label and the other end being adapted to be grasped manually to pull the leader for positioning the removably attached label inside the said space, and thereby permit the viewing of the label placed therein.

4,681,473

LOOSE-LEAF BINDER FOR STACKS OF SHEETS

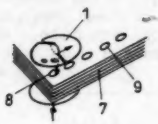
Lothar Jakob, Holteigasse 8, A-1210 Vienna, Austria

Filed Mar. 28, 1986, Ser. No. 845,467

Claims priority, application Austria, Apr. 5, 1985, 1047/85

Int. Cl.[4] B42F *13/04*

U.S. Cl. 402—15 **8 Claims**



1. Binding means for a stack of sheets, comprising an elongated connecting element adapted to be passed through the perforations of a stack of perforated sheets, and further comprising a clamping means for the connecting element formed of a generally circular plate member having a first slot extending from a mouth at the edge of the plate member in an approximately normal direction relative to said edge to approximately the center of the plate member and adapted to receive the connecting element therethrough, said plate member having a second slot extending from a mouth at the edge of the plate member at a location opposite the mouth of said first slot at an acute angle (α) relative to a tangent line to said edge at said location, to form an acute-angled portion delimited by the second slot and the edge of the plate member , said acute-angled portion being obliquely upwardly bent with respect to one side of the surface of the plate member, and wherein the edge of the plate member is chamferred from said second slot to said first slot along the acute-angled portion of said plate member.

4,681,474

ARRANGEMENT FOR HOLDING AND FILING DOCUMENTS, PAPERS AND THE LIKE

Olle Wiberg, Storvreta, Sweden, assignor to Esselte Almanacksforlag AB, Solna, Sweden

Filed Dec. 6, 1985, Ser. No. 806,271

Claims priority, application Sweden, Dec. 18, 1984, 8406435

Int. Cl.[4] B42F *13/00;* **B42D** *3/00*

U.S. Cl. 402—75 **11 Claims**

1. A system calendar folder for use with a plurality of ring mechanisms, each ring mechanism accommodating a plurality of sheets of paper having dimensions substantially smaller than conventional A4 sized sheets, said folder comprising:

a folder having front and back side piece cover portions joined together at a common inner edge and open at respective outer edges thereof;

said folder having sheet retaining means attached to the inside of said folder adjacent said common inner edge;

the improvement wherein said sheet retaining means includes means for detachably supporting one of a plurality of ring mechanisms having rings on one side for co-action with hole-punched paper sheets, said supporting means including a hook and loop fastener having a first part and a second part, said first part being attached to said ring

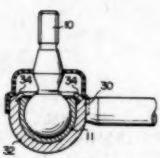
mechanism on the side thereof opposite said rings, and said second part of said hook and loop fastener being attached directly to said folder along said common edge, said fastener parts being arranged to cooperate with one another to detachably connect each ring mechanism to said supporting means to solely support said ring mechanism in said folder.

4,681,475

BALL JOINT SOCKET

Kiyoharu Kanegawa, Hamamatsu, Japan, assignor to Rhythm Motor Parts Mfg. Co., Ltd., Japan

Filed Mar. 26, 1986, Ser. No. 844,200
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—40 **3 Claims**



1. A ball joint socket of a ball joint of a motor vehicle comprising a bearing holding said ball joint and a ball shell integral with a caulking portion smaller in thickness than said ball shell, wherein

said caulking portion is bent to engage said bearing so that said ball joint is prevented from escaping from said ball joint socket and that an annular interstice is formed between an inner surface of said caulking portion and an outer peripheral surface of an upper end of said bearing radially outside of the point of engagement of said caulking portion with said bearing.

4,681,476

FLEX-LOCK DOVETAIL MOUNTING APPARATUS FOR RADIO TRANSCEIVERS AND ACCESSORIES

Nicholas Mischenko, Mt. Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

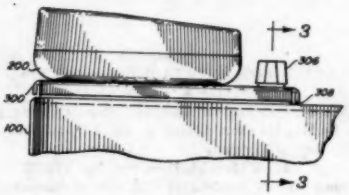
Filed May 1, 1986, Ser. No. 858,427
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—42 **10 Claims**

1. Improved dovetail mounting apparatus attachable to an accessory for mounting the accessory on a housing having on one side thereof at least two channels producing a dovetail, comprising:

a top plate having a hole therein;

a slide plate attached to said top plate, said slide plate having at one end a cut-out portion producing a gap between said cut-out portion and said top plate, said cut-out portion having a hole opposite the hole in the top plate, and said cut-out portion having at least two rails producing a dovetail and each adapted to insert into a corresponding one of said channels; and

means coupled to said top plate and said cut-out portion of said slide plate for flexing said cut-out portion toward said top plate, said flexing means including a first member and



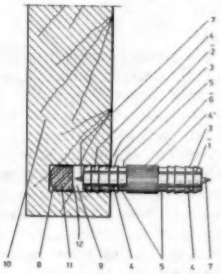
a second member mechanically coupleable to said first member, said first member being disposed in the hole in said top plate and said cut-out portion of said slide plate and being coupled to said second member for flexing said cut-out portion toward said top plate thereby locking said rails in position in said channels.

4,681,477

INVISIBLE CONNECTION FOR FACED PARTS, IN PARTICULAR FOR FURNITURE

Walter Fischer, Rationalstrasse 4, D-4520 Melle 7, Fed. Rep. of Germany

Continuation of Ser. No. 589,631, Mar. 14, 1984, abandoned. This application Nov. 5, 1986, Ser. No. 928,648
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3309953; May 7, 1983, 3316855; Jun. 3, 1983, 3320184; Oct. 21, 1983, 3338224; Nov. 15, 1983, 3341312; Nov. 25, 1983, 33424547
Int. Cl.[4] F16B *12/04, 13/02*
U.S. Cl. 403—298 **13 Claims**



1. An invisible connection for faced parts, in particular for articles of furniture of wood or material similar to wood, involving the use of adhesive and a cylindrically shaped connecting member having two end faces, in which connection said adhesive is introduced in fluid form or in the form of a paste into cylindrical boreholes in the parts to be connected and said connecting member is driven or pressed at each of its two ends into the boreholes, said connecting member having a form which is symmetrical relative to a vertical central axis, at least one longitudinally extending groove, and at least one annular notch being provided on the outer surface of said member and each of said two end faces of said connecting member being formed with a point, wherein said adhesive is hermetically enclosed in a substantially cylindrically shaped sheath having a peripheral angled-out part at an end face thereof with a covering thereon, said sheath with said enclosed adhesive being of a size such that it may be introduced as an

independent component into the borehole, said covering projecting over the cylindrical wall of the sheath so as to form a clamping element for clamping the sheath in the borehole, said sheath being pierced by the point on the end face of said connecting member and crushed, within the borehole, by said connecting member when said connecting member is driven or pressed into the borehole.

4,681,478

COUPLING FOR ROTATABLY CONNECTING A REEL WITH A DRIVE SHAFT

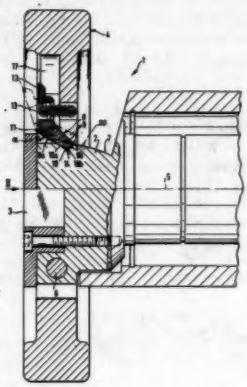
Peter Kunz, Lörrach-Hauingen, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co. KG, Lörrach-Hauingen, Fed. Rep. of Germany

Filed Mar. 14, 1986, Ser. No. 839,727

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509108

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—341 **30 Claims**



1. A coupling for rotatably connecting a pair of rotary members, particularly for rotatably connecting a drive shaft with a spool, comprising a support designed to hold the members against relative rotation and to rotate with the latter, said support being provided with a recess designed to receive a complementary portion of one of the members; an arresting element rotatable with said support and movable between a release position in which the complementary portion is insertable in and removable from said recess, and an arrest position in which removal of the complemetary portion from said recess is inhibited; and locking means for locking said arresting element against movement from said arrest position to said release position, said locking means including a bar-like element movable between an inoperative position, and an operative position in which said bar-like element bridges said support and said arresting element to thereby lock said arresting element against movement from said arrest position to said release position.

4,681,479

PORTABLE TRAFFIC CONTROL GATE

Richard H. Wagner, 1679 Elm St., and George J. Wagner, 5498 Windflower Dr., both of Livermore, Calif. 94550

Filed Jan. 22, 1986, Ser. No. 821,480

Int. Cl.[4] E01F *13/00*

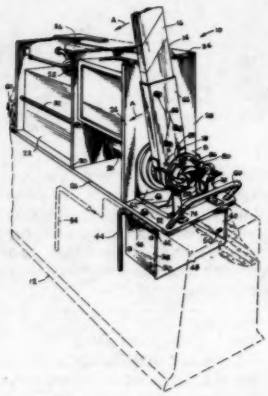
U.S. Cl. 404—6 **20 Claims**

1. A portable traffic control gate comprising,

a gate arm horizontally disposable for closing passage of traffic on a road,

means for moving said gate arm into open and closed positions, allowing the control of traffic, and

means for removably mounting said gate arm on an existing road structure, said means for removably mounting said



gate arm including a base and a pair of side plates, said base having opposing side edges, each releasably attached to a side plate by a hinge-like joint, said base supporting said gate arm and said means for moving said gate arm.

4,681,480

METHOD FOR FORMING ROADWAY-MARKING MEANS WHEREBY INDIVIDUAL RETROREFLECTING ELEMENTS ARE GATHERED AND GROUPED TOGETHER

Ludwig Eigenmann, Via Dufour3, CH 6900 Lugano, Switzerland

Filed Jul. 22, 1986, Ser. No. 888,314

Claims priority, application Switzerland, Jul. 23, 1985, 3199/85

Int. Cl.[4] E01F *9/08*

U.S. Cl. 404—14 **2 Claims**

1. A method for laying down of asymmetrical retroreflecting elements having flat sides and rounded sides upon roadway surface markings, comprising:

(a) moving said retroreflecting elements downwardly upon a vibrating inclined plane towards a depositing point such that a very high percentage of said elements is oriented with their rounded sides pointed upwardly and their flat sides against the inclined plane;

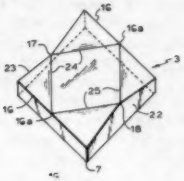
(b) during said moving downwardly, shifting and grouping the retroreflecting elements closer together, so as to provide the maximum number of mutual contacts between the individual retroreflecting elements; and

(c) sequentially of said shifting and grouping, laying down a pre-established number of transversely extending rows that have been grouped together.

4,681,481
DECORATIVE, FUNCTIONAL ELEMENT FOR CONSTRUCTION AND THE LIKE

Janusz J. Kapusta, 1060 Ocean Ave., Apartment D5, Brooklyn, N.Y. 11226

Filed May 29, 1985, Ser. No. 738,843
Int. Cl.⁴ E01C 5/00
U.S. Cl. 404—34 **12 Claims**



1. As an article of manufacture, a surface covering for a wall, a floor, a ceiling, a partition and the like comprising a three-dimensional body having a rectangular base and further defined by:

(a) a zero plane through the body parallel to the base;

(b) a minus elevation point with respect to the zero plane;

(c) a plus elevation point with respect to the zero plane; said minus and plus elevation points equidistant in plus and minus elevation from said zero plane;

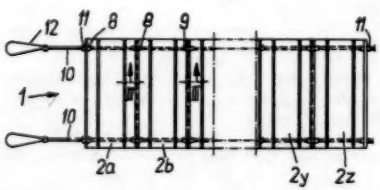
(d) a pair of first midpoints on said zero plane equidistant from two opposite edges of said body, one midpoint at one edge and midpoint at the other edge;

(e) a pair of second midpoints, one midpoint at said minus elevation point and the other midpoint located at the plus elevation point equidistant from two other opposite edges of said zero plane; each of the midpoints of the second pair of midpoints being equidistant from the zero plane; all of said midpoints located on a plane that intersects said zero plane at the first pair of midpoints, said body having a rear face extending from said base to said plus elevation point defining with the plus elevation point and zero plane a triangle, said body having a front face which includes the minus elevation point and two mirror image triangles, said body having two rectangular side faces which extend from the base to the zero plane.

4,681,482
ROLLABLE TEMPORARY ROADWAY AND APPARATUS FOR ROLLING UP AN INSTALLED TEMPORARY ROADWAY

Bernhard Arciszewski, Bottrop-Kirchhellen, and Hans-Norbert Wiedeck, Düsseldorf, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 4, 1986, Ser. No. 848,386
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512589
Int. Cl.⁴ E01C 5/16, 9/08
U.S. Cl. 404—35 **14 Claims**



1. A temporary roadway having first and second ends, the roadway additionally having a rolled state and an unrolled state wherein the roadway extends along a line between the first and second ends, comprising:

a plurality of supporting elements which are disposed beside one another in the direction of the line when the roadway is in its unrolled state;

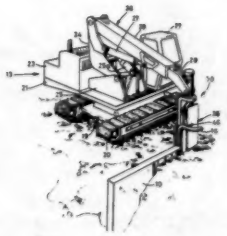
a plurality of hinge means, disposed transverse to the line when the roadway is in its unrolled state, for articulatedly connecting said supporting elements to one another, each hinge means including a bead affixed to a respective supporting element and a claw affixed to a respective supporting element adjacent said bead, said claw having a recess which is engaged by said bead; and

at least one cable which has loops and which is fastened to supporting elements at both ends of the roadway, each loop separately surrounding a respective hinge means.

4,681,483
CASTING OF STRUCTURAL WALLS

Paul Camilleri, Nerang, Australia, assignor to S.W.R. (Australia) Pty. Ltd., Nerang, Australia

PCT No. PCT/AU85/00050, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985, PCT Pub. No. WO85/04210, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 12, 1985, Ser. No. 802,009
Claims priority, application Australia, Mar. 12, 1984, PG4019
Int. Cl.⁴ E02D 5/20
U.S. Cl. 405—267 **11 Claims**



1. A method for the continuous casting of a structural concrete wall including the steps of:

mounting a work head on the distal end of an extendable boom mounted on the chassis of a moving vehicle, said work head being mounted for movement about three axes relative to the boom,

excavating a trench using an excavator mounted on said work head,

temporarily supporting the sides of the trench with moving formwork immediately following the excavator,

pumping concrete under pressure into the formwork to fill the trench and stabilize the sides of the trench, and

allowing the concrete to set to form the structural wall.

4,681,484
METHOD OF AND APPARATUS FOR CONVEYING POWDERED OR GRANULAR MATERIAL

Hans R. Egger, Küsnacht, Switzerland, assignor to Intradym Maschinen AG, Winterthur, Switzerland

Filed Jan. 16, 1985, Ser. No. 692,102
Claims priority, application Switzerland, Jan. 17, 1984, 194/84
Int. Cl.⁴ B65G 53/46
U.S. Cl. 406—63 **10 Claims**

6. An apparatus for conveying powdered or granular material comprising:

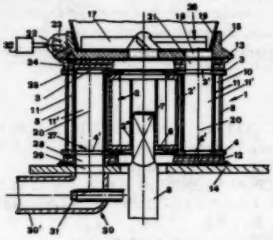
a vertically disposed rotor including a plurality of conveying chambers symmetrically arranged about an axis of the

rotor and parallel thereto, said conveying chambers having air-permeable walls;

means disposed above said rotor for charging each of said chambers with a material at a first location through an opening defined in each of said conveying chambers;

means disposed below said rotor for discharging said material from each of said chambers at a second location, spaced from said first location;

means for rotating said rotor so that said chambers are conveyed along an arced path at least from said first location to said second location;



means for sealing said opening of each said chamber while said chambers are conveyed from said first location to said second location;

means for producing an air flow;

means for delivering said air flow to said material in said chambers while they are conveyed and said openings are sealed;

a conveying line for conveying material discharged at said second location; and

an injector nozzle for injecting air from a compressed air source into said conveying line.

4,681,485

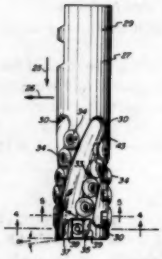
END MILL CUTTING TOOL AND INDEXABLE INSERT THEREFOR

Rob Koelewijn, Milford, Conn., assignor to GTE Valeron Corporation, Oak Park, Mich.

Filed Feb. 25, 1986, Ser. No. 833,372

Int. Cl.[4] B23C 5/02, 5/20

U.S. Cl. 407—42 **9 Claims**



6. A helical end mill cutter, comprising:

a rotary body having an outer periphery, and slots formed in its outer periphery alternately extending fully to the distal end of said body, each of said slots receiving in staggered sequence therealong rotatable cutting inserts circular in plan, providing a plurality of indexable cutting edges in said slot, each insert tiltable about the longitudinal axis of said cutter body enabling a cutting edge thereof to be disposed at a positive axial and positive radial rake, said circular insert cutting edges formed from opposed frustoconical surfaces; and

a curved rhomboidal rotatable on-edge cutting insert positioned to said fully extending slots' distal end, said curved rhomboidal insert having alternately opposed substantially planar and curved cutting edges disposed about a center, said cutting edges formed from opposed frustoconical surfaces, said cutting edges characterized by radii of curvature displaced from said center, colinear therewith substantially along an insert diagonal, said insert further positioned on said body having a portion of one of said curved cutting edges being disposed in said fully extending slot, with a cutting edge corner extending below the bottom plane of said cutter body, said curved rhomboidal insert further disposed at a positive axial rake and positive radial rake on said cutter body such that said radial rake proceeds from neutral to positive along said cutting edge upon entering a workpiece.

4,681,486

TRIANGULAR CUTTING TOOL INSERT HAVING CUTTING EDGES WITH RECESSES

Alan A. Hale, Berkhamsted, England, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1986, Ser. No. 897,241

Claims priority, application United Kingdom, Aug. 21, 1985, 8520901

Int. Cl.[4] B23B 27/22

U.S. Cl. 407—114 **13 Claims**

1. An indexable, positive rake insert for a cutting tool comprising:

a body having two spaced-apart substantially parallel side faces, the first side face having a surface larger than the second side face, the faces being substantially triangular;

three contiguous edge faces of equal length extending between the side faces, each edge face having one or more recesses which extend transversely or substantially transversely across the whole edge face from the first side face to the second side face, the recesses being spaced apart to leave a plurality of coplanar lands, the number of recesses on any two adjacent edge faces being the same;

three cutting edges formed where each edge face intersects the first side face, the recesses at the cutting edges having a width which is the same as half the width or less than half the width, of the intervening lands at the cutting edge, the lands on at least one side being positioned such that a complete cutting edge is formed with the lands on at least one other side.

4,681,487

INSERT FOR CHIP REMOVING MACHINING

Lars T. Pettersson, Gävle, Sweden, assignor to Santrade Limited, Lucerne, Sweden

Filed Jun. 30, 1986, Ser. No. 880,017

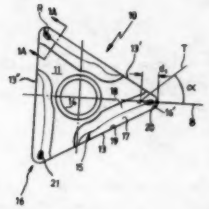
Claims priority, application Sweden, Jul. 3, 1985, 8503305

Int. Cl.[4] B23B 27/22

U.S. Cl. 407—114 **10 Claims**

1. Insert for chip removing machining, preferably for turning, comprising a mainly polygonal body of hard, wear resistant material, which has an upper face and a lower face ar-

ranged in separate mainly parallel planes and a plurality of side faces connecting said faces, at least one chip breaker asymmetrically arranged in at least one of the lower or upper faces, at least one rounded-off nose portion at the intersection of two side faces, said portion being provided with a cutting edge, said chip breaker consisting of an outer part and an inner part, said outer part forming a cutting edge at the intersection with a first side face, characterized in that the end surface of the inner part



deviates from the main direction of the inner part in the vicinity of the nose portion such that the distance between the end surface and an associated cutting edge or its extension line in a plane P parallel with the lower face increases with diminishing distance to a second side face and in that the cutting edge, the nose portion and the cutting edge of the nose portion are arranged at a distance from the associated upper or lower face, said cutting edges lying in a common plane mainly parallel with the plane P.

4,681,488

CUTTING INSERT

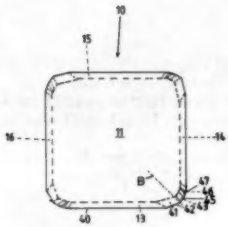
Lars O. Markusson, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Jun. 30, 1986, Ser. No. 880,062

Claims priority, application Sweden, Jul. 3, 1985, 8503304

Int. Cl.[4] B23B *27/16*; B23C *5/20*

U.S. Cl. 407—114 **9 Claims**



1. A cutting insert for chip forming machining having a polygonal basic shape, comprising two mainly parallel faces and edge surfaces joining them, lines of intersection between two of said edge surfaces and at least one of said faces forming main cutting edges and a plurality of chamfers being formed at the transition between two of said edge surfaces in a corner portion of the insert, a first of said chamfers forming a minor cutting edge at its line of intersection with said face, said corner portion having a bisector, characterized in that the transition between the minor cutting edge and the associated main cutting edge in the corner portion of the insert comprises at least two straight cutting edges which form an obtuse internal angle with each other, said main cutting edge being essentially longer than the associated minor cutting edge, the major part of said minor cutting edge being placed at one side of said bisector and the major part of the cutting edges of the second chamfers along intersection lines with said face being arranged at the opposite side of said bisector and in that the main cutting edge extends from a cutting edge of a second chamfer to a minor cutting edge at an adjacent corner portion and in that at least two maximum four second chamfers are formed between the first chamfer and the associated edge surface.

4,681,489

PROCESS OF FORMING OPENINGS

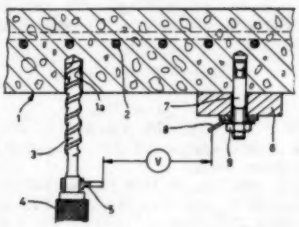
Wolfgang Millauer, and Dieter Raab, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Nov. 27, 1985, Ser. No. 802,757

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443591

Int. Cl.[4] H02G *1/12*

U.S. Cl. 408—1 R **7 Claims**



1. Process of forming openings in reinforced concrete incorporating steel reinforcing members, employing a drilling or chipping bit inserted into a hand-held drilling device for forming the opening, wherein the improvement comprises the steps of placing a non-ferrous metallic electrode into electrically conducting contact with the surface of the reinforced concrete in spaced relation from the reinforcing members, placing the electrode in electrical contact with the drilling or chipping bit, measuring the voltage developed between the electrode and the drilling or chipping bit due to the formation of a galvanic cell using the reinforced concrete as an electrolyte, and while drilling into the reinforced concrete with the drilling device utilizing the voltage change occurring upon contact of the drilling or chipping bit with a steel reinforcing member in the reinforced concrete for controlling the operation of the drilling device.

4,681,490

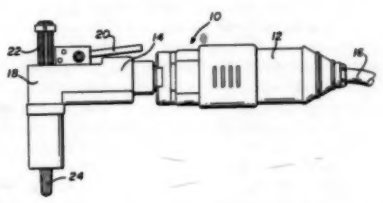
RETRACTION APPARATUS FOR AUTOMATIC FEED DRILLS OR THE LIKE

Robert A. Pennison, Bellville, and Richard E. Eckman, Houston, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 547,702, Oct. 31, 1983, Pat. No. 4,592,681. This application Mar. 27, 1986, Ser. No. 848,180

Int. Cl.[4] B23B *45/04*

U.S. Cl. 408—10 **10 Claims**



1. Improved retraction apparatus for automatic feed drills

including a housing, a rotatable tool spindle located for reciprocating movement in the housing, and driving means located in said housing operably connected with said spindle for rotating and reciprocating said spindle in feeding and retraction movements, said driving means including a spindle rotation gear engaged with said spindle to rotate said spindle and slidable thereon, a spindle feed gear engaged with said spindle to cause the reciprocating movement of said spindle, a main drive gear driven by said drive means and engaged with said spindle rotation gear to cause rotation thereof, and a feed gear engaging said spindle feed gear movable into and out of engagement with said main drive gear, said feed gear, when driven by said main drive gear, causing rotation of said spindle feed gear to move said spindle in feeding movement, and, when not driven by said main drive gear, moving said spindle in retraction movement, the improvement comprising shift means connected to said feed gear and engageable with said spindle for moving said feed gear out of driving engagement with said main drive gear.

4,681,491

MILLING MACHINE

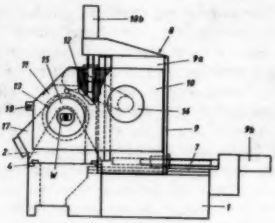
Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft, Steyr, Austria

Filed Oct. 18, 1984, Ser. No. 662,352

Claims priority, application European Pat. Off., Nov. 15, 1983, 83890211.2

Int. Cl.[4] B23C *3/06*

U.S. Cl. 409—200 **12 Claims**



1. A milling machine comprising a plurality of internally cutting inserted-tooth cutters for machining an elongate workpiece to form a plurality of axially spaced portions which are circular in cross section, which comprises

(a) a machine bed;

(b) spaced apart gripping means mounted on the machine bed and adapted to grip the elongate workpiece at both ends thereof with the axis of the workpiece in a predetermined position;

(c) two milling units spaced apart along the workpiece axis, each milling unit being movable in a plane normal to the axis of the gripped workpiece and adapted to perform a feed movement in said plane for the machining of the workpiece, each milling unit comprising

(1) a rotatably mounted tool drum holding at least one of said inserted-tooth cutters inside the drum;

(d) drive means for rotating the tool drums;

(e) feed drive means for imparting said feed movement to the milling units, the feed drive means comprising

(1) a common milling slide mounted on the machine bed, the milling units being mounted on the common milling slide, and the milling slide including means defining a free space between the milling units, and

(f) a back rest mounted on the machine bed between the milling units and received in the free space during the feed movement, the back rest supporting the gripped workpiece.

4,681,492

HIGH-SPEED SPINDLE

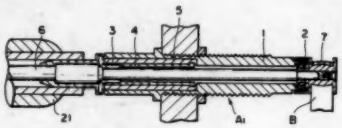
Junzo Hasegawa; Susumu Kawabata, and Nobuharu Mimura, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Mar. 25, 1986, Ser. No. 843,759

Claims priority, application Japan, Apr. 2, 1985, 60-69581

Int. Cl.[4] B23Q *1/08*

U.S. Cl. 409—231 **31 Claims**



1. A high-speed spindle which is rotatable at high speed without producing any substantial vibration or noise, said spindle comprising:

a holding member defining a casing;

a spindle shaft adapted to support a rotor rotatably;

a neck bearing disposed radially of said spindle shaft for supporting said spindle shaft rotatably, said bearing being located between one end of said spindle shaft on which said rotor is supported and the other end thereof;

damping means including a damping sleeve disposed radially symmetrically between said holding member and said neck bearing and said spindle shaft, said damping sleeve being secured to said neck bearing at one end thereof and being longer than said neck bearing, and a buffer disposed radially symmetrically between said damping sleeve and said holding member;

an end bearing secured to the end of said holding member remote from said rotor for supporting said spindle shaft at said other end thereof; and

means for transmitting power from a source of power to said spindle shaft, provided on said end bearing side of said damping means.

4,681,493

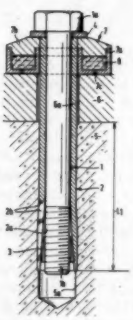
MEANS FOR MAINTAINING AXIAL STRESS ON A DOWEL ASSEMBLY

Helmut Vollmer, Balzers, Liechtenstein; Heinz Kousek, Feldkirch, and Elmar Maier, Tisis, both of Austria, assignors to Hilti Aktiengesellschaft

Filed May 7, 1985, Ser. No. 731,555

Int. Cl.[4] F16B *31/04*

U.S. Cl. 411—8 **10 Claims**



1. In a dowel to be anchored in a borehole or the like in a receiving material, such as concrete, masonry or the like, where the dowel assembly is axially elongated includes an

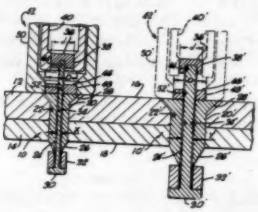
abutment arranged to be spaced exteriorly of the receiving material for applying an axial load on said dowel assembly relative to the receiving material, wherein the improvement comprises a container arranged to be positioned between said abutment and the exterior of the receiving material, said container formed so that is expandible only in the axial direction of said dowel assembly, said container defining an interior receiving space, an hydraulic mass capable of expanding when exposed to a reaction liquid located within said receiving space so that said container can expand in the axial direction of the dowel assembly for applying a pressing force on said abutment relative to the receiving material, said container comprises a first part and a second part and said receiving space located at least in one of said parts, and said first and second parts being displaceable in the axial direction of said dowel assembly when said hydraulic mass expands.

4,681,494

DRIVE NUT BLEND FASTENER WITH CAP NUT

John D. Pratt, Rancho Cucamonga, and Victor Belanger, Huntington Beach, both of Calif., assignors to Monogram Industries, Inc., Culver City, Calif.

Filed Oct. 4, 1985, Ser. No. 784,348
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—54 **7 Claims**



1. A blind fastener for mounting in aligned openings through two workpieces to connect them together in overlapping outer and inner relation and adapted to be set by wrench means, the fastener comprising:

an internally threaded, generally tubular fastener body received within the openings in the workpieces having,

an inner end projecting inwardly beyond the inner workpiece, and

an enlarged body head for engagement with the outer surface of the outer workpiece,

an externally threaded cylindrical stem passing in threaded engagement through said fastener body, turning motion of said stem relative to said fastener body in one direction moving said stem in an axially outward direction through said fastener body, said stem having an enlarged stem head spaced from the inner end of said fastener body,

a deformable sleeve around said stem in contact with said stem head, movement of said stem outwardly through said fastener body deforming said sleeve to a fully set condition in overlying contact with the inner surface of the inner workpiece,

a drive nut separate from said fastener body for threaded mounting on said stem in abutment with said body head restraining said fastener body from turning in the workpieces, said drive nut having an outer surface for engagement by the wrench means; and

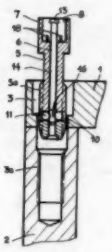
a cap nut fixedly mounted on the outer end of said stem, said cap nut having an outer surface for engagement by the wrench means, said drive nut and said cap nut being adapted for concurrent engagement by the wrench means for holding said drive nut against rotation and turning said cap nut to turn said stem relative to said fastener body in said one direction.

4,681,495

DEVICE AND PROCESS FOR FIXING TWO PARTS WITH A CAPTIVE SCREW

Gérard Crespin, Villeurbanne, and Jean Coussau, Paris, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Oct. 29, 1984, Ser. No. 666,022
Claims priority, application France, Oct. 23, 1983, 83 17279
Int. Cl.[4] F16B *39/22*
U.S. Cl. 411—298 **4 Claims**



1. Device for permanently fixing two parts (1, 2) together, comprising a captive screw engaged over a part of its length (3*a*) in a threaded hole (3) machined in one of the two parts (1, 2) and a means (11) for locking said screw in said threaded hole (3), which locking means is movable inside said screw, in which said screw (5) comprises over its entire length and along its axis a bore (6) communicating with at least one radially directed hole (10) opening out on an outer side surface of a threaded part (5*a*) of said screw (5) and enclosing said locking means (11), said locking means being movable in said hole (10) and having a size in the radial direction substantially equal to the maximum thickness of a tubular wall of said screw (5) in its threaded part (5*a*), and a maneuvering rod (14) engaged without substantial clearance in said bore (6) and comprising, at one of its ends outside said bore, a head (15) having a diameter larger than the diameter of said bore (6) and, at its other end, a part having a reduced diameter (16) facing the hole (10) enclosing said locking means (11) when said maneuvering rod (14) is in a first, out-of-service position, locking of said screw (5) being obtained by axial movement of said maneuvering rod (14) inside said bore into a locking position, said axial movement bringing a part of said rod (14) having an unreduced diameter in contact with said locking means (11), which is thereby moved radially so as to distort by compression at least one thread of said threaded hole (3), said screw (5) additionally comprising distortable parts (18) in the region of said head (15) of said maneuvering rod (14) for crimping said rod (14) in its locking position on said screw.

4,681,496

REUSABLE AND ADJUSTABLE FASTENER FOR USE WITH POWER TOOL APPLICATOR

Gabriel V. Fasolino, 1829 NE. Stanton St., Portland, Oreg. 97212

Continuation of Ser. No. 625,622, Jun. 28, 1984, abandoned. This application May 1, 1986, Ser. No. 858,356
Int. Cl.[4] F16B *19/00, 35/02*
U.S. Cl. 411—361 **2 Claims**

1. A fastener for clamping a pair of members together comprising:

an elongated substantially straight shank having opposite ends,

first shank means at one end of said shank having circumferential grooves arranged for anchoring engagement with a power tool,

second shank means adjacent said first shank means having substantially circumferential grooves,

a collar arranged to be placed on said second shank means

and also arranged to be swaged into axial locking and non-rotative engagement with said grooves of said second shank means by the power tool,

said collar serving as a first abutment for one member to be clamped against another member,

a severable area between said first and second shank means by means of which said first shank means can be separated from said second shank means by the power tool,

third shank means at the end of said second shank means which is opposite from said first shank means,

screw threads on said third shank means,

a nut arranged for threaded engagement with said third shank means forming a removable and adjustable abutment which when in place cooperates with said collar to clamp a pair of members together from opposite sides in preloaded condition,

anti-loosening means operative on said nut,

and at least two flattened surfaces on said collar serving as a wrench engaging portion for holding said shank against rotation when said nut is adjusted or removed.

4,681,497

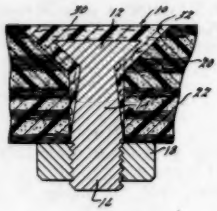
ENCAPSULATED FASTENER

Imre Berecz, El Toro, Calif., assignor to Microdot Inc., Darien, Conn.

Filed May 29, 1985, Ser. No. 739,027

Int. Cl.[4] A47G *3/00*; B64C *1/12*

U.S. Cl. 411—377 **1 Claim**



1. An encapsulated fastener for introduction through an aperture in a workpiece having conductive fibers therein, said fastener comprising a metal bolt having a head portion at one end, a threaded portion at the other end, and a shank between said head and end portions, and a plastic cap encapsulating the head portion of said bolt having a plurality of resin encapsulated electrically conductive fibers therein, said electrically conductive fibers being substantially electrically isolated from said metal bolt by the plastic resin of said cap, the radially outer periphery of said plastic cap being abraided to enhance electrical connection between the conductive fibers thereof and the conductive fibers of said workpiece intersecting the periphery of the aperture in said workpiece whereby electrical continuity is provided by the cap on said bolt across the aperture in said workpiece.

4,681,498

CLIP FASTENER FOR CORNER JOINTING SECTION PROFILE ELEMENTS

Giuseppe Raffoni, Via Domenico Bolognesi 24, Forlì , Italy

Filed Mar. 10, 1986, Ser. No. 837,895

Claims priority, application Italy, Mar. 12, 1985, 14714/85[U]

Int. Cl.[4] F16B *15/00*

U.S. Cl. 411—461 **4 Claims**

1. A clip fastener for corner jointing section profile elements comprising two mutually substantially perpendicular walls, forming one corner, and two ribs protruding substantially perpendicularly with respect to said walls, said walls and said ribs defining a cutting edge and an opposite edge have a substantially W-shaped profile, wherein according to the improvement each of said ribs comprises an intermediate portion and opposed end portions, said opposed end portions having said cutting and opposite edges located at a greater distance from said corner than said intermediate portion.

4,681,499

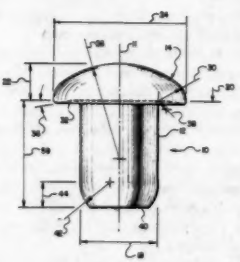
CONTROLLED EXPANSION PROTRUDING-HEAD RIVET DESIGN AND METHOD OF INSTALLING SAME

Kenneth P. Sparling, Burbank; Angelo Incardona, Rosearda; Garth D. Kikendall, Glendale; David G. Richardson, Burbank; Ronald E. Wood, Sepulveda, and Leon Bakow, Sherman Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 4, 1984, Ser. No. 657,700

Int. Cl.[4] F16B *19/06*

U.S. Cl. 411—507 **4 Claims**



1. A protruding-head rivet for joining two or more structural elements together, the rivet having a shank portion with a minimum and maximum diameter, the rivet providing a controlled expansion of the hole when the hole has a minimum diameter equal to the maximum shank diameter and a maximum diameter 1.05 times the minimum shank diameter, the rivet comprising:

a protruding-head portion having the following dimensions:

a head diameter of between 1.642 times the minimum

shank diameter and 1.706 times the maximum shank diameter;

a center-head spherical radius of between 1.320 times the minimum shank diameter and 1.406 times the maximum shank diameter;

a spherical outer-head radius of between 0.321 times the minimum shank diameter and 0.353 times the maximum shank diameter, said spherical outer radius blending with said center head spherical radius;

a head height of between 0.455 times the minimum shank diameter and 0.479 times the maximum shank diameter; and

an underhead downward angle of between 5 and 6 degrees measured from the intersection of said shank and said head.

4,681,500

DELIVERY UNIT FOR BOOKBINDING MACHINES

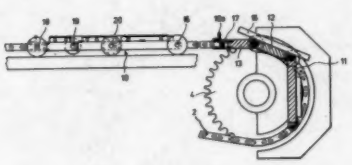
Horst Rathert, Minden; Gerhard Grannemann, Petershagen, and Ulrich Erdboris, Rahden, all of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,704

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508236

Int. Cl.[4] B42B 5/00; B65G 47/31

U.S. Cl. 412—33 **20 Claims**



1. Conveyor apparatus for transferring moving workpieces from a first level to a second level which is vertically displaced from the level, said conveyor apparatus comprising:

drive means, said drive means including a continuous band which passes over fixed position rotatable members which change the direction of said band, said band and rotating members defining plural linear path segments, a pair of said path segments being respectively commensurate with said first and second levels, a third of said path segments being intermediate the path segments of said pair and being inclined; and

a plurality of spatially displaced carrier plate defining means coupled to said band from movement therewith while supporting workpieces, said plate defining means each including:

a plurality of plate segments;

means pivotally interconnecting said plate segments; in series;

means engaging said interconnected plate segments to prevent load induced deflection thereof during movement along said linear path segments whereby said plate segments form a substantially flat support surface for a workpiece;

means pivotally connecting a first of said plate segments to said band, said first plate segment being the leading plate segment in the direction of travel of said carrier plate defining means; and

means connecting a second of said plate segments to said band, said second plate segment being the trailing plate segment in the direction of travel of said carrier plate defining means, said second plate segment connecting means permitting relative longitudinal movement between at least said second plate segment and said band.

4,681,501

ARTICLE TRANSFER APPARATUS

Samuel H. Edwards, and James A. Edwards, both of Aden Road, Enfield, Middlesex EN3 7SX, United Kingdom

Continuation-in-part of Ser. No. 796,218, Nov. 8, 1985, abandoned, which is a continuation of Ser. No. 538,814, Oct. 5, 1983, abandoned. This application Aug. 28, 1986, Ser. No. 885,183

Claims priority, application United Kingdom, Oct. 12, 1982, 8229050; Aug. 2, 1983, 8320779

Int. Cl.[4] B65G 57/18

U.S. Cl. 414—42 **1 Claim**

1. An apparatus for transferring articles from a first station having a roller conveyor to a second station comprising:

a plurality of first conveyors located between the rollers of said roller conveyor of said first station;

a plurality of second conveyors that can move from a first position wherein said plurality of second conveyors can receive articles to be transferred from said plurality of first conveyors to a second position located above said second station, said second station containing an item into which said articles can be stacked, each of said plurality of second conveyors being associated with motor means; and

a plurality of pairs of support members, each pair of support members, in use, having a spacer supported therebetween, said support members, in use, being moved upwardly so that the spacer associated therewith comes into contact with said articles, and in which, once said articles have lifted above the level of said plurality of second conveyors, said plurality of second conveyors are moved in the reverse direction to their original position, said support members thereafter being moved downwardly so that said spacer and articles move downwardly therewith, whereby, when said spacer contacts said item or a layer of articles already stacked, movement of said support members is stopped, said support members then moving downwardly thereafter so that the spacer associated therewith becomes disengaged therefrom and said articles are correctly stacked, said support members thereafter being moved upwardly and inwardly to their original position for the next set of articles to be supplied from said plurality of second conveyors.

4,681,502

CONVEYING APPARATUS FOR THE PROCESSING OF PRINTED ITEMS

Helmut Staufner, Alte Schiffahrt 4, 7300 Esslingen-Mettingen, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,369

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430255; Apr. 26, 1985, 3515068

Int. Cl.[4] B65G 59/04

U.S. Cl. 414—121 **12 Claims**

1. In a device for separating stacked objects, particularly flat objects such as bound publications having a binding or spine along one portion thereof, using a plurality of receptacle-like object holders that move between a loading station and a separating station, an arrangement including

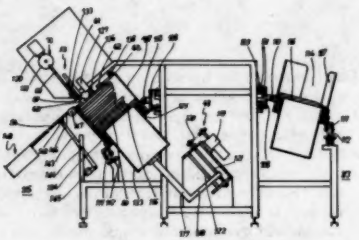
means defining a generally vertical rotational axis such that the loading station and separating station are locating at opposing positions relative to said axis,

means including at least two opposing receptacle-like object holders cooperatively arranged to be capable of a relative rotational movement around said axis alternately between

the loading station and the separating station whereby at a given point one of said holders is in the separating station at the same time that the other said holder is in the loading station, and further to be capable while undergoing such rotational movement and/or while changing stations of also executing a relative radial sliding motion with respect to said axis in the course of which said opposing holders first move toward one another and then away from one another,

each said holder having a holder floor on which the objects can be placed in stacked form and also having a removal side,

a floor lifting device associated with each said holder which moves in coordination with a change of station for the graduated raising and lowering of the respective holder floor,



a suction device above a corresponding said holder whenever said holder is in the separating station and which suction device moves up and down for removing the top object on the stack thereat at any given time, and

an inclined slide plate on the removal side of said holder whenever said holder is in the separating station,

the holder floors of said holders at least during the time they are in the separating station being inclined from the vertical towards the removal side and towards said slide plate, and

the lifting devices associated with respective ones of said holder floors being separated therefrom and arranged for actuating independently of one another and independently of the position of the associated holder at any given time, whereby said holders can be completely unloaded each time they are in the separating station.

4,681,503

METHOD AND DEVICE FOR UNLOADING BULK MATERIAL FROM A LARGE CONTAINER

Günther Nolte, Moers, Fed. Rep. of Germany, assignor to Conrad Scholtz AG, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP84/00409, § 371 Date Aug. 28, 1985, § 102(e) Date Aug. 28, 1985, PCT Pub. No. WO85/03279, PCT Pub. Date Aug. 1, 1985

PCT Filed Dec. 18, 1984, Ser. No. 774,599

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402649

Int. Cl.[4] B65G *63/00*

U.S. Cl. 414—144 **10 Claims**

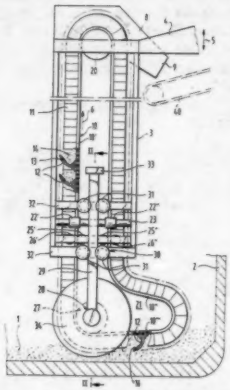
1. A conveying device for unloading bulk material from a large container, particularly a ship, comprising:

an elongate framework adapted to be attached to a crane mechanism to extend therefrom and define a generally vertically-extending portion for being progressively lowered by the crane mechanism into the container as the bulk material is unloaded therefrom;

a flexible conveyor belt comprising rubber-like material and having inner and outer sides of predetermined width and defining conveying and returning legs and including a plurality of flexible transversely-aligned entraining cleat means comprising rubber-like material and mounted on said outer side and spaced-apart from each other in the longitudinal direction of said conveyor belt and having an angled scoop-like cross-section for defining with said conveyor belt conveying compartments for conveying the bulk material, said endless conveyor belt having an effective length longer than said framework and being positioned within said framework along the length thereof to extend outwardly therefrom at its lower extremity in a free loop formed by the intrinsic weight of said conveyor belt without external tensioning and supporting means;

a driving roll for receiving said inner side of said conveyor belt therearound and driving said conveyor belt in the direction of the angled scoop-like cross-section of said cleat means while allowing the lower extremity of said conveyor belt below said framework to travel freely in the loop formed by its intrinsic weight;

guide means carried by the lower extremity of said framework for receiving said conveying and returning legs of said conveyor belt and for guiding and maintaining said legs in a desired plane and lateral alignment, each of the



guide means being located on either side of a plane defining a center of said vertically-extending portion of said framework; and

delimiting drum means carried by said framework for generally vertical movement under its own weight and engaging said inner side of the lower extremity of said conveyor belt forming the loop for maintaining said conveying leg of said conveyor belt as it starts its upward path of travel in a path of travel defining generally a rectilinear extension of the path of travel of said conveying leg within said frame-work the drum means being located within the plane defining the center of said vertically-extending portion of said framework;

whereby, the loop of said conveyor belt below said framework is deformed and shortened from said delimiting drum means back to said returning leg to form a rectilinear portion at the bottom of the loop under the back pressure of the bulk material during the unloading operation to enhance such unloading operation.

4,681,504

STORAGE AND INVENTORY CONTROL SYSTEM FOR KEYS

James A. Welch, Sr., 2132 Dunshire Dr., Tallahassee, Fla. 32308

Filed Jul. 11, 1985, Ser. No. 753,967

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—268 **3 Claims**

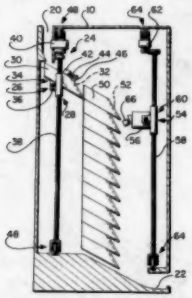
1. A storage and inventory control assembly for a plurality of individual keys, wherein each individual key has a distinct purpose, said assembly comprising:

a plurality of inclined storage receptacles, each receptacle adapted and constructed to hold at least one individual key, each receptacle is provided with an openable gate which holds a key in the receptacle when the gate is closed and release a key from the receptacle when the gate is opened;

a positioning means for receiving individual keys and placing a key in a selected storage receptacle;

a withdrawal means for withdrawing an individual key from one of the storage receptacles, the withdrawal means having an opening element for opening the opening gate and releasing the key from the selected storage receptacle;

whereby a control means controls the operation of the positioning means and the withdrawal means, the control



means directs the positioning means to deposit a key in a selected storage receptacle and also directs the withdrawal means to withdraw a key from a selected storage receptacle, the control means comprises a microprocessor that is electrically coupled to the positioning means and the withdrawal means, the microprocessor is provided with a storage means for storing operational instructions and subroutines, and usage data about the use of individual keys, an input means is used for inputting into the microprocessor a user identification code, identifying the user, a use code identifying how an individual key is used, and a display means is provided displaying key usage data stored in the microprocessor including how an individual key is used, who used an individual key, and an individual key's current location.

4,681,505

STOCKER IN REEL SUPPLY APPARATUS

Hideki Kobayashi, Tokyo; Yutaka Okumoto, Musashino, and Mikio Komori, Matsudo, all of Japan, assignors to Japan Tobacco Company, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,357

Claims priority, application Japan, Feb. 15, 1984, 59-025154

Int. Cl.[4] B65H *19/30*

U.S. Cl. 414—744 R **3 Claims**

1. A stocker in a reel supply apparatus for delivering a loaded reel having an open core cylinder of a predetermined diameter onto a movable carrier running on a track, said stocker comprising:

a stationary base positioned along said track;

a motor fixedly mounted on said stationary base;

a revolvable cylindrical body having a vertical axis, said cylindrical body revolvable about said vertical axis, said cylindrical body having a first stop position and a second stop position, said first stop position and said second stop position being angularly displaced from one another by 180 degrees;

support means, fixedly mounted to said stationary base, for supporting said cylindrical body for rotation about said vertical axis;

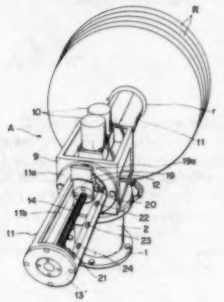
gear transmission means, operably connected to said motor and to said cylindrical body, for revolving said cylindrical body about said vertical axis in response to operation of said motor;

sensor means for detecting said first stop position and said second step position;

locking means for locking said cylindrical body at said first and second stop positions, said locking means operable in response to sensing of said first and second stop position by said sensor means;

a gear box mounted on top of said cylindrical body;

a pair of reel support arms fixedly attached to said gear box to extend horizontally on opposite sides thereof, said support arms having a diameter substantially corresponding to the predetermined diameter of the open core cylinder of the reel to allow the insertion thereof into said core cylinder for snugly, slidingly receiving the reel thereon and holding the reel thereon at a right angle thereto, said pair of reel support arms extending perpendicular to said track at said first stop position and said second stop position, each reel support arm comprising a pair of elongated



arc sections, said pair of elongated arc sections defining a pair of diametrically opposed gaps therebetween, each reel support arm having an inner end adjacent said gear box and an outer end remote from said gear box, each reel support arm having a pair of shaft supporting plates, each shaft supporting plate mounted at a respective end of said reel support arm;

pusher means, disposed on said reel support arms, for movement therealong to push the reels outwardly stepwise one-by-one, said pusher means comprising a rotatable threaded shaft journaled in each pair of said shaft supporting plates and a pusher member threadingly engaging said rotatable threaded shaft and extending through said gaps of said reel support arm at right angles with said reel support arms; and

a drive motor, provided at said inner end of said rotatable threaded shaft, for rotating said threaded shaft by a predetermined amount to push each reel outward in a stepwise manner by a distance corresponding to a reel thickness, whereby said reels are moved along said reel support arms while maintaining a right angle with said reel support arm.

4,681,506

TABLE FEED APPARATUS

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,810

Claims priority, application Japan, Jun. 21, 1985, 60-133999

Int. Cl.[4] B65G *25/00*

U.S. Cl. 414—749 **8 Claims**

1. A table feed apparatus comprising:

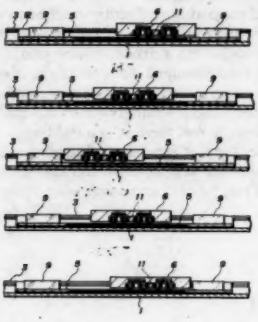
fixed bed;

a first movable table mounted through first linear bearing

means on said bed for movement in a direction relative to said bed;

a second movable table mounted through second linear bearing means on said bed in a vertically spaced relation with said first movable table for movement in the same direction in which said first movable table is movable relative to said bed;

first brake means attached to said first movable table for selectively placing said first movable table into a fixed or movable relation to said bed;



second brake means attached to said second movable table for selectively placing said second movable table into a fixed or movable relation to said bed; and

a linear motor disposed between said first and second movable tables for driving said first and second movable tables to move relative to each other when one of said first and second movable tables is fixed to said bed by the associated one of said first and second brake means while the other table is freely movable.

4,681,507

METHOD OF AUTOMATICALLY DE-BAGGING CAN ENDS AND LIKE ARTICLES

Wallace W. Mojden, Hinsdale, and Robert E. Darr, Chicago, both of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.

Division of Ser. No. 541,362, Oct. 12, 1983, Pat. No. 4,580,938. This application Jan. 28, 1986, Ser. No. 823,348

Int. Cl.[4] B65B *69/00*

U.S. Cl. 414—786 **9 Claims**

1. A method of de-bagging a stack of articles such as a stack of can ends contained in a bag, comprising the steps of, orienting the bag and contained articles, in a vertical position, producing relative movement between the articles and the bag bottom to create a space between the bag bottom and the articles, at least partially slitting the bag at the space and below the lowermost article, and removing the slit bag from the stack of articles.

4,681,508

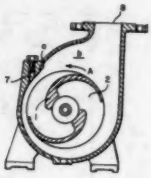
SUPERCAVITATION CENTRIFUGAL PUMP

Choong W. Kim, 756-173, Bupyong-dong, Buk-ku, Inchon, Rep. of Korea

Continuation of Ser. No. 671,303, Nov. 14, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 935,593

Int. Cl.[4] F04D *7/04, 29/22*

U.S. Cl. 415—116 **3 Claims**



1. A supercavitation centrifugal pump comprising:

an impeller casing defining an impeller chamber, a discharge port and a suction port operatively connected to said impeller casing,

a water inlet means disposed within said impeller casing for the introduction of water into the impeller chamber, and

impeller means disposed to move eccentrically within the impeller chamber to a location in close proximity to the impeller casing, said impeller means being provided with at least one blade which contains a deep recess which extends substantially radially from the blade shaft towards the periphery of the blade and further extends substantially perpendicular to said radial extension whereby the pump is free from abrasion caused by solid matters in the fluid, said water inlet means being positioned within said impeller casing at a location in the vicinity of the narrow space between the impeller casing and the end portions of the blades for facilitating the conveyance through said centrifugal pump.

4,681,509

VARIABLE INLET FAN ASSEMBLY

Robert J. Davis, Birmingham, Mich., assignor to American Davidson, Inc., Hyde Park, Mass.

Continuation of Ser. No. 633,571, Jul. 23, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 859,199

Int. Cl.[4] F04D *29/46, 29/68*

U.S. Cl. 415—161 **23 Claims**

1. A variable inlet vane assembly for use with force draft and induction draft systems having fans mounted upon shafts, said variable inlet vane assembly comprising:

(a) a mounting base;

(b) a hollow frustro-conical hub having an inner and an outer face, said hub of smaller diameter than said mounting base and supported in spaced relationship from said base by a plurality of supports;

(c) a plurality of variable inlet vanes, said vanes pivotally supported by said mounting base and said hub;

(d) said hub and said mounting base defining the throat of the passageway for air passing through said variable inlet vanes with said variable inlet vanes extending longitudinally substantially entirely across said passageway from said mounting base to said hub;

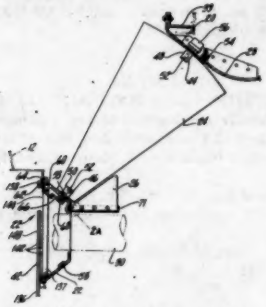
(e) linkage means to pivot said variable inlet vanes, said linkage means carried along the inner face of said hub;

(f) actuating means carried by said hub and connected to said linkage means for actuation of said linkage means, said actuating means comprising a continuous ring-like section received within said hub and supported upon said inner face of said hub;

(g) self-lubricating annular sliding bearing means interposed between said actuating means and said hub;

(h) bearing retaining means functioning to maintain said sliding bearing means in a fixed position; and

(i) a plurality of dorsal vanes, said dorsal vanes being downstream and in close relationship to said variable inlet vanes and mounted stationarily thereto to control back eddies of air at low vane closures;



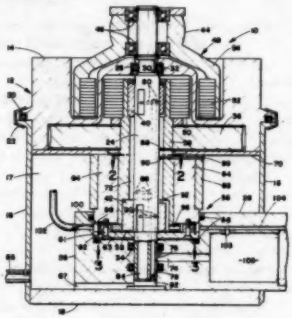
whereby said variable inlet vane assembly is mounted in close proximity to a fan and acts to preswirl incoming air in the direction of rotation of the fan impellers to reduce the work load upon said fan for moving a given volume of air; the sliding bearing means and ring-like actuating means supported upon the inner face of the hub allows for a shorter axial length for the linkage means between the actuating means and the variable inlet vanes, and the hub defines the inner boundary of the air passage thereby allowing for larger inlet vanes for any sized variable inlet vane assembly to present greater control over preswirl of the incoming air, thereby improving the efficiency of the system; and said linkage means is located outside said air flow and is of minimum length and simpler in construction thereby reducing corrosion and maintenance problems due to airborne particulate contaminants and complexity of structure.

4,681,510

PUMP FOR SATURATED LIQUID

Paul F. Swenson, Jr., Shaker Heights, and Charles E. Heinrich, Mentor, both of Ohio, assignors to TRD Corporation, Cleveland, Ohio

Filed Jan. 2, 1986, Ser. No. 815,572
Int. Cl.[4] F04D *25/08*
U.S. Cl. 415—168 **4 Claims**



1. A pump especially suited for pumping saturated liquids comprising:

(a) a first member defining a generally cylindrical inner wall;

(b) a second member mounted for rotation on said first member and defining a generally cylindrical outer wall radially spaced from said inner wall to form an elongated annular chamber;

(c) means for driving said second member for rotation relative to said first member;

(d) a rotary pump impeller mounted closely adjacent an end of said annular chamber, said pump impeller being mounted for rotation with said second member;

(e) means for supplying liquid through said inner wall to said annular chamber at a location axially spaced from said impeller; and,

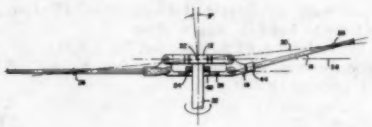
(f) vapor discharge means carried by said second member and extending through said annular chamber and terminating in an inlet end located adjacent the inner wall at a position axially spaced from said inlet in a direction opposite said impeller.

4,681,511

LOW VIBRATION HELICOPTER ROTOR

Edward W. Glatfelter, Newton Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 782,238
Int. Cl.[4] B64C *27/43*
U.S. Cl. 416—131 **10 Claims**



1. A helicopter rotor, comprising:

a rotor hub having a geometrical center lying on a horizontal axis;

at least two rotor blades, each defining a longitudinal axis;

a pitch housing for each rotor blade, each rotor blade being mounted to its respective pitch housing;

mounting means associated with each pitch housing and its respective rotor blade for mounting the associated pitch housing to the rotor hub and defining thereby a flap hinge for said respective rotor blade; and

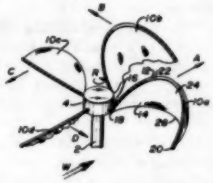
separating means connected to and extending between two diametrically opposed pitch housings mounted on the rotor hub, such that the rotor hub, the diametrically opposed pitch housings and the associated connected separating means form a four-bar linkage with the center of gravity of the diametrically opposed blades lying in a straight line which intersects the rotor hub geometrical center at all cyclic conditions.

4,681,512

SELF-FAIRING WINDMILL VANE

Maxwell K. Barnard, 1933 San Juan, Port Townsend, Wash. 98368

Filed Jun. 6, 1986, Ser. No. 871,243
Int. Cl.[4] F03D *3/06*
U.S. Cl. 416—132 B **19 Claims**



1. A windmill vane for use in a windmill having a shaft

disposed for rotation by the wind in a selected direction around the longitudinal axis of the shaft, said vane comprising:

(a) a rigid, generally open, generally planar frame standing out from and fixedly carried by the shaft, the frame having a central portion and first and second ends, the frame being oriented in a plane with the central portion of the frame leading the ends thereof relative to the instantaneous direction of movement of the frame around the shaft, such plane being inclined at an angle of about forty-five degrees (45°) relative to such instantaneous direction of movement; and

(b) a sail comprising a light weight, resilient substantially wind resistant material, the sail extending continuously between

(i) a head edge attached along the frame, and

(ii) a foot edge extending continuously between the ends of the frame and being otherwise unattached thereto; the orientation of the frame and the length of the foot edge of the sail being such that the sail is full when moving with the wind and streams behind the frame and has minimal drag when moving across and against the wind.

4,681,513

TWO-STAGE PUMP ASSEMBLY

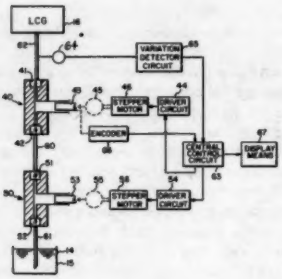
Toshinori Saito, and Makoto Takeuchi, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Jan. 28, 1986, Ser. No. 823,341

Claims priority, application Japan, Feb. 1, 1985, 60-18437; Feb. 1, 1985, 60-13150[U]

Int. Cl.[4] F04B *41/06, 49/06, 3/00*

U.S. Cl. 417—2 **5 Claims**



1. In a two-stage pump assembly having two pumps A and B and a control means for controlling the operation of each pump in such a way that the pump assembly delivers fluid, each of the two pumps having a cylinder constituting a chamber, a plunger fitted in the cylinder and making reciprocating motion to vary the capacity of the chamber, and one-way valves disposed at the suction port and at the discharge port, respectively, of the chamber, the improvement comprising:

(A) the suction port of the pump A is connected to the discharge port of the pump B, and the discharge port of the pump A and the suction port of the pump B act as the discharge port and the suction port, respectively, of the whole pump assembly;

(B) said means for controlling causing the suction stroke of the pump B (period T_{b1}) to start simultaneously with the discharge stroke of the pump A (period T_{a1}), and the discharge of the pump B (period T_{b3}) to start simultaneously with the suction stroke of the pump A (period T_{a3});

(C) said means for controlling causing a compression stroke in pump B during a period of T_{b2} between the suction stroke and the discharge of the pump B;

(D) the periods being so set as to satisfy the following reactions:

$$T_{a1}=T_{b1}+T_{b2},\ T_{a3}=T_{b3},\ T_{a1}>T_{a3},\ T_{b1}>T_{a3};$$

and,

(E) wherein said means for controlling each pump comprises

(i) two stepper motors each having a rotating output shaft and the capability of causing rotation of the shaft in either direction,

(ii) cams fixed to each rotating shaft for bearing upon followers attached to the exposed ends of each plunger respectively, and

(iii) said stepper motors being controlled to rotate back and forth within an angular range controlled according to the desired flow rate.

4,681,514

RADIAL PISTON PUMP HAVING SEALING DISC

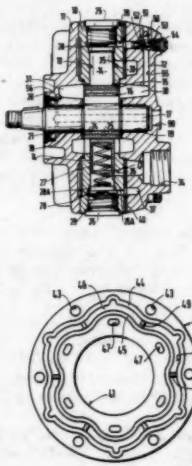
Klaus Griese, Kupferzell; Siegfried Mayer, Vaihingen/Enz, and Dieter Weigle, Bad Urach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,681

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513164

Int. Cl.[4] F04B *49/00, 1/04*

U.S. Cl. 417—213 **12 Claims**



1. In a radial piston pump comprising a housing formed with a plurality of radially extending bores receiving a plurality of radial pistons; a drive shaft; an eccentric arranged on said shaft, said pistons having inner faces supported on said eccentric; two end covers supporting said shaft at two ends thereof and closing said housing, each bore having an outlet passage; a plurality of outlet valves each positioned in a respective bore and connected to a respective outlet passage, each outlet valve including a valve body, a spring loading said valve body in a closing direction, and a valve seat; and an annular suction passage formed in one of said end covers and connected to said bores, the improvement comprising a sealing disc positioned between one of said end covers and a side of said housing facing said one end cover, said sealing disc having at least one substantially annular and sealed through passage (**42, 76, 77**) connecting said outlet passages to said bores, and a plurality of suction throttling through passages (**47**) each connected to said annular suction passage and to a respective one of said bores,

whereby an amount of a pressure medium sucked through said throttling passages in said sealing disc and thus a pressure medium flow through the pump can be limited.

4,681,515

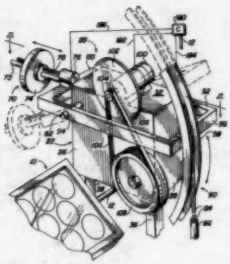
WALKING BEAM PUMP HAVING ADJUSTABLE CRANK PIN

James C. Allen, 102 W. 8th St., Safford, Ariz. 85548

Continuation-in-part of Ser. No. 704,948, Feb. 25, 1985, abandoned. This application Jul. 9, 1986, Ser. No. 883,578

Int. Cl.[4] F04B *49/00, 35, 04;* F16H *35/08*

U.S. Cl. 417—218 **27 Claims**



1. Variable capacity pump apparatus having an upstroke and a downstroke, comprising, in combination:

input electrical means;

drive motor means powered by the input electrical means;

bull gear means rotationally driven by the drive motor means;

a pivoting shaft;

walking beam means rigidly secured to the pivoting shaft and pivotally movable therewith and adapted to be connected to a pump for providing pumping strokes for pumping a liquid;

link means rigidly connected to the pivoting shaft and movable to pivot the pivoting shaft;

crank pin means, including a crank pin, secured to the bull gear means and connected to the link means to pivot the link means in response to rotation of the bull gear means, and the location of the crank pin defines a pivot arm for the link means, the pivoting shaft, and the walking beam means; and

electrical controller means for varying the pumping capacity of the walking beam means in response to the input electrical means.

8. Variable stroke pump apparatus, comprising, in combination:

output drive motor means;

bull gear means driven by the output drive motor means and having an axis of rotation;

a pivoting shaft;

walking beam means rigidly secured to the pivoting shaft and pivotally movable therewith and adapted to be connected to a pump for providing pumping strokes for pumping a liquid;

link means rigidly connected to the pivoting shaft and movable to pivot the pivoting shaft;

crank pin means movable relative to the axis of rotation of the bull gear means and movably connected to the link means to pivot the link means in response to rotation of the bull gear means and movable relative to the link means for providing a variable pivot arm for pivoting the link means, the pivoting shaft, and the walking beam means; and

controller means for moving the crank pin means toward and away from the axis of rotation of the bull gear means to vary the length of the pivot arm of the link means and the length of stroke of the walking beam means.

4,681,516

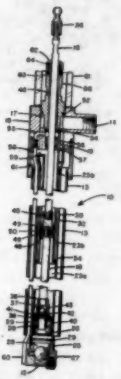
LEAKAGE PREVENTING LIQUID SUPPLY PUMP

John G. O'Hara, Shoreview; Frederick A. Powers, Maple Grove, and Steven E. Peter, Richfield, all of Minn., assignors to Graco Inc., Minneapolis, Minn.

Continuation of Ser. No. 735,581, May 20, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,084

Int. Cl.[4] F04B *19/04*

U.S. Cl. 417—259 **2 Claims**



1. A reciprocable liquid supply pump for pumping thermosetting liquids and the like and adapted for driving connection through a predetermined stroke to a reciprocable motor through a connecting rod projecting from a housing casting at an upper end of said pump, comprising

(a) a liquid outlet in said housing casting approximate the upper end of said pump and a downwardly projecting pump outer cylinder attached to said housing and having an upper interior portion in a liquid flow communication with said outlet;

(b) an inner cylinder attached to said housing casting and concentrically positioned inside the upper end of said pump cylinder, and having an upper interior portion isolated from liquid flow communication with said outlet, and having a lower interior portion in liquid flow communication with said outlet;

(c) an outer cylinder housing concentrically positioned about said pump outer cylinder and attached at an upper end to said housing casting, said outer cylinder housing extending downwardly and terminating in an opening about said pump outer cylinder;

(d) a first chamber and passage in said housing casting, said first chamber and passage providing liquid flow communication between the interior of said inner cylinder and the interior of said outer cylinder housing;

(e) a lower piston attached to said connecting rod and slidably positioned in said pump outer cylinder;

(f) an upper piston attached to said connecting rod and slidably positioned in said inner cylinder between the upper interior portion and the lower interior portion of said inner cylinder;

(g) a seal in said housing casting above said first chamber and about said connecting rod, and a second chamber above said seal; and

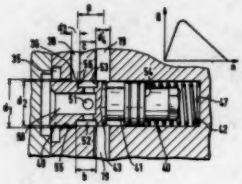
(h) a bleed tube attached to said housing casting and having an upper opening in flow communication with said second chamber and a lower opening projecting downwardly to at least said outer cylinder housing lower opening.

4,681,517

HYDRAULIC PUMP

René Schulz, Neu-Anspach; Heinz Teubler, and Peter Breuer, both of Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Vickers Systems GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 854,132
Int. Cl.[4] F04B 49/00
U.S. Cl. 417—300 7 Claims



1. A hydraulic pump arrangement comprising

a hydraulic pump,

said hydraulic pump having a housing (1, 2) which includes a rotor cavity and a valve bore (55), and a rotor (7) which is driven at varying speeds (n), said housing including an inlet passage system (16, 17, 18, 19, 20) having inlet ports (20) and a relief duct (19), and outlet ports (33) connected to a pressure chamber (35),

said housing and said rotor forming at least one displacement region (11, 12) to which lead said inlet ports and outlet ports,

a flow control valve (40),

an output passage system (36, 37, 38, 39) including a valve output duct (38), a metering orifice (36) and an external pump outlet (37),

said pressure chamber (35) and said inlet passage system (16, 17, 18, 19, 20) communicating with each other by way of said control valve (40), which bypasses an excess delivery flow into said relief duct (19) of said inlet passage system and outputs a controlled output flow (Q) to said output passage system,

said flow control valve (40) including a spool (41) guided in said valve bore (55) of said housing and having a first higher pressure spool face (53) and a second lower pressure spool face (54), a valve spring (42) acting on said second spool face,

said metering orifice (63) being connected to said first and second faces (53, 54) so as to transmit a pressure drop of said controlled output flow (Q) at said orifice (36) to said spool (41),

the improvement wherein

said spool has an extension portion (49) and a hollow space (50) in it,

said spool extension (49) also having an outer annular chamber (52) limited by said first spool face (53) and a third spool face (56) which define an annular chamber width (b), and communicating with said pressure chamber (35),

said valve output duct (38) having an end extending generally radially in the direction of the flow control valve (40) and being at an axial spacing (c) from said relief duct (19) as considered in the direction of movement of said spool (41) which is less than said width (b) of said annular chamber (52),

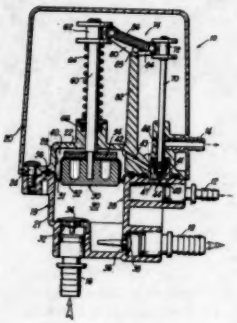
said end of said output duct (38) forming said metering orifice (36) in cooperation with said third spool face (56), whose position reduces the effective width of said metering orifice (36) with increasing pump speed (n), thus producing a generally falling output flow-pump speed characteristic through said hollow space (50) in said spool (41).

4,681,518

SINGLE-ACTING, GAS OPERATED PUMP

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 702,515, Feb. 19, 1985, abandoned. This application Dec. 20, 1985, Ser. No. 811,863
Int. Cl.[4] F04B 43/06
U.S. Cl. 417—395 37 Claims



1. A method for pumping a liquid with a single-acting, gas operated pump comprising the steps of:

(a) providing a pump body including a main chamber therein separated by a reciprocatable piston means into a gas driving chamber and a liquid pumping chamber;

(b) feeding liquid one way into and out of said liquid chamber;

(c) alternately reciprocating a control valve for feeding driving gas into said driving chamber and exhausting gas therefrom to cause said piston means to reciprocate and to alternately pump liquid out of said liquid chamber and to draw liquid thereinto, respectively;

(d) biasing said piston means toward said gas driving chamber;

(e) snap-moving said single control valve from one of its two end positions to the other with a snap-acting spring mechanism coupled between said piston means and said control valve, in response to reciprocating movement of said piston means;

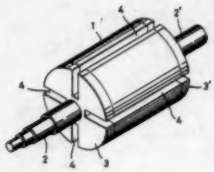
(f) wherein said biasing step comprises positioning a coil compression spring in said liquid chamber; and

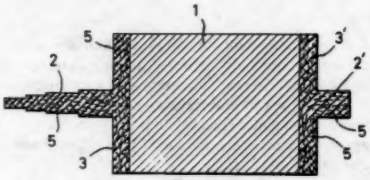
(g) including forming said pump body from only an upper body and a lower body connected together and forming said main chamber between said upper and lower bodies and forming a control valve chamber separate from said main chamber and between said upper and lower bodies, providing said gas passageway between said control valve chamber and said main chamber in said upper body and providing a single integral sealing element between said upper and lower bodies consisting of a flexible diaphragm separating said main chamber into said gas driving chamber and said liquid pumping chamber and an O-ring integral with said diaphragm for sealing said control valve chamber.

4,681,519
ROTOR FOR ROTARY FLUID PUMP

Hiroshi Sakamaki, Tochigi; Susumu Sugishita, and Yukio Horikoshi, both of Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 16, 1984, Ser. No. 610,664
Claims priority, application Japan, May 20, 1983, 58-88928
Int. Cl.[4] F04C 29/00
U.S. Cl. 418—152 6 Claims





1. A rotor for a rotary fluid pump, comprising:

a central portion formed of metal; and

two opposite end portions including shaft means, said end portions and said shaft means being comprised of a fiber-reinforced metal matrix composite wherein said metal of said central portion is the metal matrix of said composite and the metal of said central portion is continuous with the metal matrix of said composite.

4,681,520
WINDSHIELD REPAIR ASSEMBLY

Robert R. Birkhauser, III, Madison, Wis., assignor to Auto Glass Specialists, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 569,753, Jan. 10, 1984, Pat. No. 4,597,727, which is a continuation-in-part of Ser. No. 470,440, Feb. 28, 1983, abandoned. This application Jun. 30, 1986, Ser. No. 880,060
Int. Cl.[4] B29C 31/04
U.S. Cl. 425—12 11 Claims

1. A repair assembly for use in repairing windshield breaks, comprising:

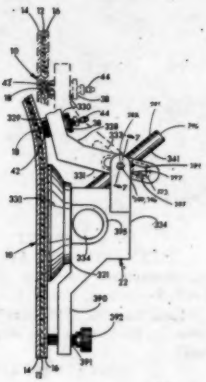
(a) a suction cup base;

(b) a neck having a first section with a circular opening, and also having a second section formed at an angle to the first section which second section has a lengthwise slit;

(c) means for pivotally connecting the neck to the suction cup base through the lengthwise slit of the second section of the neck;

(d) means for adjusting and locking the position of the neck in relationship to the suction cup base; and

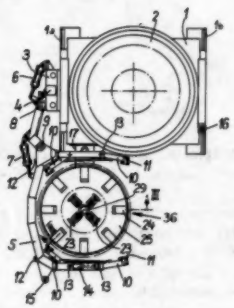
(e) a screw having a lengthwise cylindrical opening and adapted to be positioned in the circular opening of the first section of the neck, wherein the suction cup base may be attached to a windshield near a windshield break and the screw may be positioned over the windshield break and substantially perpendicular to the windshield by selective moving and pivoting of the neck and selective adjustment and locking of the adjusting and locking means.



4,681,521
FEEDING AND POSITIONING APPARATUS FOR A HEATING PRESS

Klaus Grotkasten, Hamburg, Fed. Rep. of Germany, assignor to Fried. Krupp G.m.b.H., Essen, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,083
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443947
Int. Cl.[4] B29C 35/02
U.S. Cl. 425—36 14 Claims



1. A feeding and positioning apparatus for transporting a tire blank to a tire-heating press, comprising:

a stand for holding the tire blank prior to its transport to the press, said stand including a stationary horizontal platform and support means movable in a horizontal direction relative to said platform;

aligning means cooperating with said support means for centering the tire blank with respect to a bead thereof, said aligning means extending vertically within the tire blank and having means movable in a radial direction against the bead of the tire blank; and

gripping means for transporting the centered tire blank from the stand to the press, said support means including a base disk surrounding said platform, a plurality of supports arranged about the circumference of said disk for supporting the tire blank along its lateral edge and ball bearings

for allowing said disk to be horizontally moved with respect to said platform.

4,681,522

MELT SPINNING APPARATUS

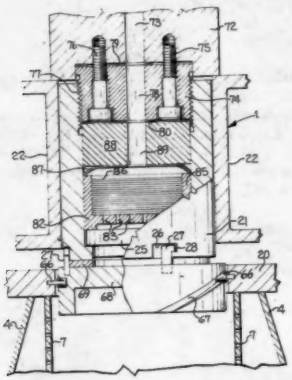
Erich Lenk, Remscheid, Fed. Rep. of Germany, assignor to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,480

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430847

Int. Cl.[4] B29C *47/30*

U.S. Cl. 425—72 S 16 Claims



1. A melt spinning apparatus for extruding and spinning a thermoplastic material to form a plurality of filaments, and comprising

a spinneret comprising a melt supply block and a nozzle assembly, said nozzle assembly including a tubular casing threadedly mounted to said melt supply block so as to define a central axis and such that said casing may be readily assembled to and disassembled from said block by rotation of said casing about said central axis, and with said tubular casing having an open outlet end disposed coaxially about said central axis,

a spinning tube disposed in coaxial alignment with said outlet end of said tubular casing of said nozzle assembly,

means mounting said spinning tube so that at least the portion thereof adjacent said outlet end of said tubular casing is axially movable between an operative position in contact with said outlet end and an axially withdrawn position, and

casing assembly means mounted to the end of said spinning tube adjacent said outlet end for rotation about said central axis and including means for engaging said outlet end of said casing so as to impart rotation thereto upon rotation of said casing assembly means to thereby facilitate threaded assembly and disassembly of said tubular casing with respect to said melt supply block.

4,681,523

CONVEYOR FOR PARTICLEBOARD-MAKING APPARATUS

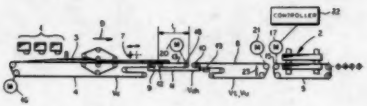
Werner Thelen, Kempen, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 767,956

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431126

Int. Cl.[4] B27N *3/16*; D29C *43/48*

U.S. Cl. 425—168 5 Claims



1. A transfer conveyor for use in combintaion with:

an upstream conveyor normally moving continuously in a longitudinal transport direction at a predetermined relatively slow speed and having relative to the direction a downstream end displaceable in the direction;

means for forming a continuous particulate band on the upstream conveyor;

cutter means for longitudinally subdividing the band into a longitudinal succession of mats; and

press means downstream in the direction from the upstream conveyor for receiving the mats and pressing them into hard panels;

the transfer conveyor comprising:

a downstream conveyor having an upstream end spaced downstream from the downstream end of the upstream conveyor and a downstream end at the press;

an intermediate endless-belt conveyor independent of the upstream and downstream conveyors, extending between the upstream end of the downstream conveyor and the downstream end of the upstream conveyor, and having upstream and downstream ends fixed relative to each other and respectively confronting the downstream and upstream ends of the upstream and downstream conveyors;

a carriage displaceable in the direction and carrying the intermediate conveyor, the downstream end of the upstream conveyor, and the upstream end of the downstream conveyor, both ends of the intermediate conveyor as well as the downstream end of the upstream conveyor and the upstream end of the downstream conveyor being fixed on the carriage;

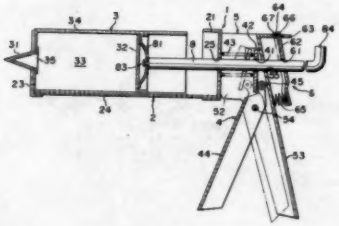
drive means for operating the upstream conveyor generally only at the relatively slow transport speed in the direction, for operating the downstream conveyor generally always at a substantially higher transport speed in the direction, and for operating the intermediate conveyor either at the relatively slow speed or at the higher speed of the downstream conveyor without changing the length of the intermediate conveyor between its ends; and

control and drive means connected to the carriage, to the cutter means, and to the drive means for reciprocating the carriage in the direction synchronously with the operation of the cutter means and for operating the intermediate conveyor at the slow speed when a mat is bridging it and the upstream conveyor and for operating it at the higher speed when a mat is bridging it and the downstream conveyor.

4,681,524
EXTRUSION DEVICE

Shigeru Ikeda, Yuki, and Naomi Okamura, Kuki, both of Japan, assignors to Cemedine Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 773,548
Claims priority, application Japan, Sep. 8, 1984, 188644
Int. Cl.[4] B29C 47/00
U.S. Cl. 425—376 R 17 Claims



1. An extrusion device for extruding viscous material, said extrusion device comprising:

(a) a main body adapted to receive a tubular container containing viscous material and having a nozzle at the distal end and a slidable bottom at the proximal end;

(b) a push rod supported by said main body so as to be slidable in the axial direction of said main body, whereby, in use, viscous material in a tubular container received in said main body is extruded from the nozzle at the distal end of the tubular container when the slidable bottom at the proximal end of the tubular container is pushed toward the distal end of said main body by said push rod; and

(c) a push rod control means comprising:

(i) a supporting plate projecting from said main body at least generally parallel to the axial direction of said push rod, said supporting plate having an aperture therethrough;

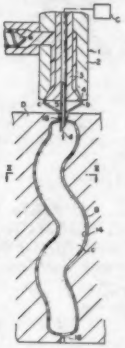
(ii) a control piece having a first end, a second end, and a control opening therethrough intermediate its first and second ends, said control opening receiving said push rod, the first end of said control piece being received in said aperture in said supporting plate and being both axially movable relative to said push rod and said main body and pivotably movable relative to said push rod and said main body; and

(iii) a first spring member interposed between said main body and the second end of said control piece, said first spring member urging said control piece to pivot into an inclined position relative to the axis of said push rod, in which inclined position opposed portions of the periphery of said control opening frictionally engage said push rod, which frictional engagement is maintained when said push rod and said control piece are moved axially relative to said main body until contact of said control piece with the periphery of said aperture causes said control piece to pivot relative to said push rod so as to release the frictional engagement between said push rod and the opposed portions of the periphery of said control opening.

4,681,525
APPARATUS FOR MOLDING PLASTIC PRODUCTS

Shoji Shimizu, Ohta, Japan, assignor to Excell Corporation, Tokyo, Japan

Division of Ser. No. 494,693, May 18, 1983, Pat. No. 4,550,008, which is a continuation-in-part of Ser. No. 273,396, Jun. 15, 1981, abandoned. This application Sep. 23, 1985, Ser. No. 778,663
Int. Cl.[4] B29C 17/07, 17/12
U.S. Cl. 425—527 6 Claims



1. Apparatus for producing simultaneously a plurality of sheet-type plastic products out of a single parison by means of blow molding, comprising:

a nozzle for discharging a parison with an intended diameter;

means for supplying a parison material to said nozzle;

means for supplying a pressurized gas into the interior of said parison, the pressure level of said pressurized gas being adjustable at different levels;

means for supplying a separating agent into the interior of said parison thereby forming a thin film of separating agent along the inside surface of said parison; and

a plurality of mold sections which may be assembled to define a mold cavity for said parison, each of said mold sections having a predetermined molding surface and being so structured that a flash-forming recess is defined along a joint line between two adjacent mold sections, when assembled, for forming a flash having a film of separating agent sandwiched therein and extending from an inside surface of said parison into said flash beyond an edge of each corresponding product, said edge being defined during subsequent flash removal.

4,681,526
APPARATUS FOR MOLDING THERMOPLASTIC PIPES

Manfred A. A. Lupke, 92 Elgin St., Thornhill, Ont., Canada L3T 1W6

Filed Apr. 9, 1986, Ser. No. 849,850
Int. Cl.[4] B29C 51/24
U.S. Cl. 425—532 4 Claims

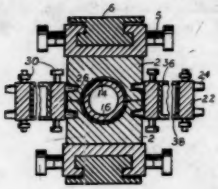
1. In an apparatus for molding externally ribbed and corrugated thermoplastic pipes, including:

a pipe die for extruding a parison of a thermoplastic material;

moldblock halves circulating in an endless path containing a straight forward run wherein the halves cooperate with each other in the directions of their circulation and perpendicularly to the latter, to form a travelling mold for the thermoplastic pipe, a return run and two semi-circumferential guide tracks for transferring the halves between said runs;

a means for withstanding the hydraulic pressure of molding acting to separate the halves in the straight forward run in said perpendicular direction;

the improvement, wherein in order to avoid high loads and wear in said forward run, said means is (represented by) two endless series of circulating yokes having shanks for engagement along said travelling mold with complimentary recesses made in the halves, and the shanks being engageable with both molds of each cooperating pair of mold halves in recesses therein to hold the mold halves together.



4,681,527

APPARATUS FOR THE INJECTION MOULDING OF DISC RECORDS

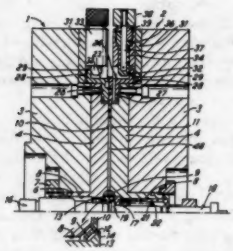
Henri Amory, Chambourcy, and Jean-Michel Prost, Orgeval, both of France, assignors to Pathe Marconi EMI SA, Boulogne Billancourt, France

Filed May 6, 1985, Ser. No. 730,514

Claims priority, application France, May 4, 1984, 84 06930

Int. Cl.[4] B29C *45/34*

U.S. Cl. 425—546 **10 Claims**



1. Apparatus for the injection moulding of disc records, said apparatus including a first half-mould associated with a first matrix and a first fixing sleeve, and a second half-mould associated with a second matrix and a second fixing sleeve, each matrix being clamped to its associated half-mould by means of its associated fixing sleeve such that a substantially disc-shaped moulding cavity having a circular periphery is formed between facing surfaces of the first and second matrices, an annular air passage being provided adjacent to the periphery of the disc-shaped moulding cavity for permitting escape of air from the moulding cavity during a moulding operation, means releasably mounting said first and second fixing sleeves around said first and second half-moulds respectively, said first and second fixing sleeves being provided with first and second flanges respectively, said flanges extending inwardly into a peripheral annular space between the matrices, the first and second flanges supporting the first and second matrices against the first and second half-moulds respectively, the first flange being provided with an inner annular blade, the annular blade having a substantially constant thickness and an inner edge defining a moulding surface at the periphery of the disc shaped moulding cavity, the annular blade lying radially within the second flange, one or more portions of either the first or the second flange having a thickness which is greater than the thickness of the annular blade, said one or more portions lying in an annulus situated radially outside the inner edge of the annular blade such that the disc shaped moulding cavity has a width which is substantially defined by the thickness of said one or more portions and the annular air passage has a width which is substantially defined by the difference between the thickness of said one or more portions and the thickness of the annular blade.

4,681,528

VALVE NOZZLE FOR INJECTION MOLDING

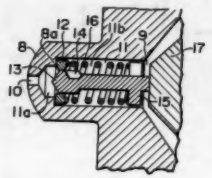
Yoshio Maruyama, Kyoto, and Shoshi Kabashima, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1986, Ser. No. 874,058

Claims priority, application Japan, Jun. 18, 1985, 60-132215

Int. Cl.[4] B29C *45/23*

U.S. Cl. 425—562 **2 Claims**



1. An injection molding valve nozzle for supplying melted and pressurized resin into a metallic mold comprising:

a nozzle head including a resin inlet at a rear end, a resin injection outlet for discharge resin into said mold at a front end and a resin flow passage between said inlet and outlet;

a gate for separating said resin flow passage into a front passage and a rear passage;

a spool slidably mounted for movement towards and away from said outlet and including at least one groove extending axially along the outer surface of said spool for opening and closing a flow port in said gate upon movement of said spool towards and away from said outlet, a spring disposed in said resin flow passage for biassing said spool in a direction away from said outlet, said spool being movable by forces applied thereto by said spring and by resin pressure existing in said first and second passages, said groove being arranged on said spool such that it does not move to a position to open said flow port until resin pressure in said rear passage attains a predetermined value, said spring biassing said spool to a position where said groove no longer opens said flow port when a pressure difference which exists between said front and rear passages is reduced to below a predetermined value.

4,681,529

AUTOMATIC ELECTRONIC IGNITION SYSTEM

William Home, 9-3 Fl., No. 374, Sec. 2, Pa Teh Road, Taipei, Taiwan

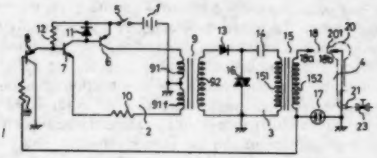
Filed May 28, 1986, Ser. No. 867,682

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—74 **2 Claims**

1. An automatic electronic ignition system circuit, comprising an oscillatory circuit, a charging circuit and a sparking device, and characterized in that the ignition system circuit has a trigger disposed between a first transformer and a second transformer and being in parallel therewith to control the charging circuit, a neon lamp disposed across two electrodes of said sparking device, one of the sparking electrodes being disposed on a metal outlet, said outlet having gas nozzles and being supplied gas via a gas pipe, said gas nozzles facing the other sparking electrode with a suitable gap therebetween such that the flames being caused by the sparking device between the sparking electrodes are used as a control switch to control

the ignition system so as to automatically produce sparks and ignite the gas when the flames for some reason go out and also



includes means such that the sparking action is automatically stopped when a flame exists.

4,681,530

GAS CONTROL DEVICE FOR CONTROLLING THE FUEL GAS AND OXIDIZING AGENT SUPPLY TO A BURNER IN AN ATOMIC ABSORPTION SPECTROMETER

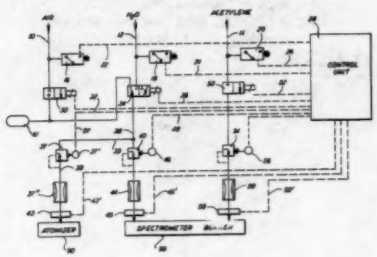
Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 16, 1986, Ser. No. 863,770

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529547

Int. Cl.[4] F23N *1/02*

U.S. Cl. 431—89 **11 Claims**



1. A gas control device for controlling the fuel gas and oxidizing agent supply to a burner (**99**) in an atomic absorption spectrometer, comprising:

(a) a fuel gas line (**14**) for supplying fuel gas to said burner (**99**);

(b) an oxidizing agent supply line (**10, 12**) for supplying an oxidizing agent to said burner (**99**);

(c) a first restrictor (**58**) and a first pressure regulator (**54**) connected upstream of said first restrictor for said fuel gas line;

(d) a second restrictor (**44**) and a second pressure regulator (**40**) connected upstream of said second restrictor for said oxidizing agent line;

(e) first (**56**) and second (**46**) servomotors for reproducibly adjusting the pressure settings of said pressure regulators, respectively;

(f) a control unit (**28**), by means of which the servomotors are controllable in a reproducible manner; and

(g) first (**59**) and second (**45**) flowmeters connected to control unit **28**, wherein said first flowmeter (**59**) is connected downstream of said first restrictor (**58**) and said second flowmeter (**45**) is connected downstream of said second restrictor (**44**), for providing said control unit with a measure of the rate of flow of said fuel gas and said oxidizing agent.

4,681,531

PROCESS AND EQUIPMENT FOR THE THERMIC CONVERSION OF THE COMPONENTS OF GAS CURRENTS CONTAMINATING THE ENVIRONMENT

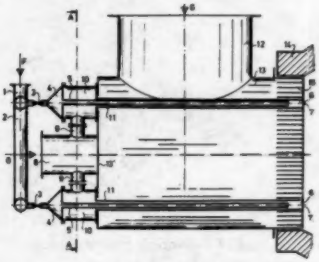
Zoltán Nagy, Budapest; György Hupka, Veszprém; Ottó Szalay, Veszprém, and Attila Kovács, Veszprém, all of Hungary, assignors to Magyar Asvanyolaj es Foldgaz Kiserleti, Veszprem, Hungary

Filed Sep. 7, 1984, Ser. No. 648,535

Claims priority, application Hungary, Sep. 23, 1983, 3294

Int. Cl.[4] F23C *5/08*

U.S. Cl. 431—181 **4 Claims**



1. An apparatus for the thermic conversion of contaminants of a gas stream, which comprises:

(a) an inlet chamber,

(b) a resolving chamber axially aligned with, in fluid communication with and connected to one end of said inlet chamber,

(c) a contaminant-laden gas inlet stud means in fluid communication with said inlet chamber, for delivering a contaminant-laden gas whereby said contaminant-laden gas will flow in parallel to the axis of said inlet chamber from said inlet chamber to said resolving chamber,

(d) a bottom plate for closing the other end of said inlet chamber opposite the one end thereof connected to said resolving chamber,

(e) means for delivering an oxidizing gas and a heating medium to the end of the inlet chamber connected to said resolving chamber including a plurality of pairs of co-axially arranged pipe elements uniformly distributed throughout said inlet chamber,

(f) each of said pairs of co-axially arranged pipe elements being arranged parallel to the axis of said inlet chamber,

(g) one of said pipe elements of each of said pairs of co-axially arranged pipe elements being arranged to transport and deliver said oxidizing gas to the end of the inlet chamber connected to said resolving chamber,

(h) the other of said pipe elements of each of said pairs of co-axially arranged pipe elements being arranged to transport and deliver said heating medium to the end of the inlet chamber connected to said resolving chamber,

(i) each of the pipe elements of each of said pairs of co-axially arranged pipe elements being arranged and configured relative to one another to define a mixing space closely adjacent to the end of the inlet chamber connected to said resolving chamber whereby said oxidizing gas is mixed with said heating medium,

(j) the end of each of said pairs of co-axially arranged pipe elements defining a burner immediately adjacent said resolving chamber for burning said mixed oxidizing gas and heating medium whereby said burners provide a plurality of uniformly distributed combustion flames at the connection of said inlet chamber and said resolving chamber,

(k) whereby said contaminant-laden gas flows parallel to the axis of the inlet chamber through said uniformly distrib-

uted flames from the inlet chamber to said resolving chamber, whereby said contaminant-laden gas is subjected to an accelerated and optimally highly elevated temperature combustion.

4,681,532

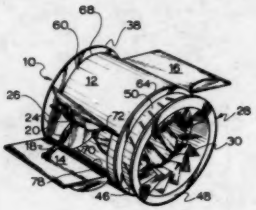
BOILER FURNACE AIR REGISTER

Landy Chung, 5144 Cliff Dr., Ashtabula, Ohio 44004

Filed May 2, 1985, Ser. No. 729,690

Int. Cl.[4] F23M *9/00*

U.S. Cl. 431—183 **39 Claims**



1. The method of delivering combustion air to an industrial heating flame comprising the steps of:

(1) directing a pair of streams of air toward each other to form a single rotating stream of air;

(2) compressing said streams of air within radially decreasing hollow frustoconical confines;

(3) imparting spiral rotation with an axial thrust to said single stream of air toward said flame; and

(4) expanding said stream of air into a cylindrical envelope about said hearing flame.

4,681,533

VAPOR BURNER FOR LIQUID FUEL

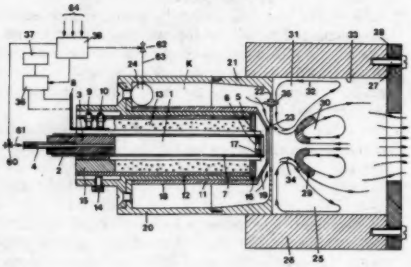
Jorgen H. Petersen, and Peter J. M. Clausen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 550,318, Nov. 11, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,356

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243398

Int. Cl.[4] F23D *11/44*

U.S. Cl. 431—208 **24 Claims**



1. A vapour burner, comprising, elongated supply means for supplying and discharging fuel in a gasified form, said supply means including a tubular member having a front outlet through which gasified fuel is discharged, an air supply passage system surrounding said tubular member, said air supply system having an inlet through which air is supplied tangentially relative to said tubular member to produce a rotating and axially moving column of air surrounding said tubular member, means for defining a combustion chamber that has a radially outer periphery and a rear end, the means defining the combustion chamber including an axially elongated cylindrical shaped burner tube having a rear end portion axially adjacent to the tubular member outlet and radially spaced therefrom and a front end portion axially forwardly remote from the tubular member outlet, the burner tube being of a substantially larger diameter than the tubular member and defining the radial outer periphery of a combustion chamber, and an annular closure wall defining the rear end of the combustion chamber and having a central opening forming an inlet to the combustion chamber, the annular closure wall extending between the air supply passage system and the burner tube rear end portion, and in cooperation with the air supply system forming a mouth through which air supplied at the air system inlet passes to the combustion chamber inlet, said air supply system including guide means inclined relative to and cooperable with said closure wall for radially converging said rotating column of air in a forward direction adjacent to said mouth to pass through the combustion chamber inlet, said guide means including a concial front guide wall that is spaced from the closure wall and in cooperation with the closure wall form an annular gap through which the column of air moves to and through the combustion chamber inlet and into the combustion chamber as a conical jet, said conical wall having a front opening through which fuel from the supply means passes toward the combustion chamber and a rear end of a greater inner diameter than the diameter of its front opening.

4,681,534

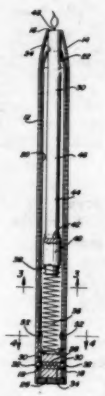
CANDLE HOLDER WITH DRAIN HOLES

Robert W. Schenke, P.O. Box 271, and Reynold A. Schenke, P.O. Box 59, both of Paradise, Pa. 17562

Filed May 21, 1986, Ser. No. 865,470

Int. Cl.[4] F23D *3/16*

U.S. Cl. 431—290 **5 Claims**



1. A lifetime candle including, in combination, a permanent candle holder and a consumable candle for use with the holder, said holder including an elongated upstanding outer tubular member including an upwardly tapering upper end defining an upper end opening of a diameter slightly smaller than the diameter of said candle and an open lower end, an inner tubular member including upper and lower ends and removably mounted in said outer tubular member through the lower end thereof closing the latter and in which said candle is slidingly received, spring bias means in said inner tubular member yieldingly upwardly biasing said candle therein to a position with the upper end of said candle projecting upwardly from the upper end of said inner tubular member and abuttingly en-

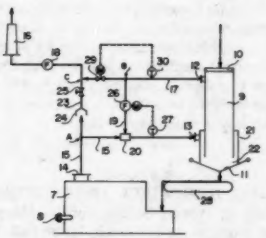
gaged with the inner surfaces of said outer tubular member upper end disposed about said opening and the wick of said candle projecting upwardly through said opening, said lower end of said inner tubular member including permanently mounted plug means closing the lower end of said inner tubular member, said inner tubular member lower end including drain opening means formed therein for draining hot water and other candle wax dissolving liquid from said inner tubular member lower end after said liquid is introduced into the upper end of said inner tubular member for dissolving and flushing away solidified wax previously collected within said inner tubular member.

4,681,535

PREHEATING MECHANISM FOR SOURCE METAL FOR MELT

Osamu Kobari, Funabashi, and Takashi Kida, Yachiyo, both of Japan, assignors to Toho Development Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,924
Int. Cl.[4] F27D *19/00*
U.S. Cl. 432—48 **11 Claims**



1. A preheating mechanism for preheating a source metal for melt in a combination of independent combustion and preheating devices, comprising: a high-temperature gas conduit for connecting said combustion device and said preheating device; a low-temperature gas conduit for connecting said preheating device and an exhaust gas chimney; a branch pipe branched from said low-temperature gas conduit at a branch portion and connected to said high-temperature gas conduit at a coupling portion; a short-cut gas conduit for connecting a portion of said high-temperature gas conduit at a combustion device side from said coupling portion to a portion of said low-temperature gas conduit at an exhaust gas chimney side from said branch portion; diluting means arranged in said short-cut gas conduit; first gas flow control means arranged in said branch pipe; and a first temperature sensor arranged between said preheating device and said coupling portion between said high-temperature gas conduit and said branch pipe, said first gas flow control means being adapted to control a gas flow in said branch pipe in response to a signal from said first temperature sensor.

4,681,536

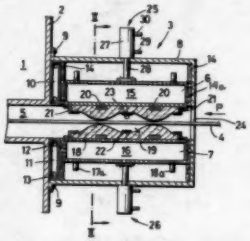
CHARGING SLUICE FOR ANNEALING OVEN

Rudolf Jansen, Monschau, Fed. Rep. of Germany, assignor to Otto Junker GmbH, Simmerath, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,874
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430205
Int. Cl.[4] F27B *9/28*; F26B *25/12*
U.S. Cl. 432—59 **9 Claims**

1. In an annealing oven having an interior and an inlet opening and provided with

a transporting sluice arrangement for sealing the interior of the oven from outside air and continually feeding a material to be annealed, particularly a metallic tape into the interior of the oven, wherein a buffer atmosphere is maintained, the transporting sluice arrangement comprising a housing attached to the annealing oven; a sealing device positioned in said housing before the inlet opening of the oven, said sealing device including two sealing members spaced from each other to form a space through which said material is continually transported, said sealing members being adjustable relative to each other in the direction



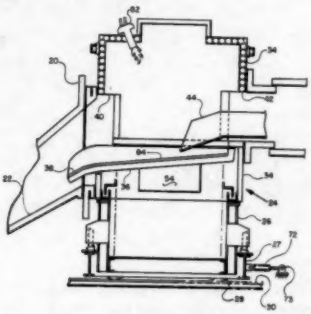
normal to the direction of transportation of said material, said sealing members being thin-wall hollow plates, each plate having at a side facing said material a coating of ceramic felt; and means for adjusting the position of each plate, said means including two pneumatic cylinders each connected to the assigned plate to move the latter in the direction normal to the direction of transportation.

4,681,537

METHOD AND APPARATUS FOR CONTINUOUSLY CHARGING A STEELMAKING FURNACE

John A. Vallomy, Matthews, N.C., assignor to Intersteel Technology, Inc., Matthews, N.C.

Filed May 29, 1986, Ser. No. 868,380
Int. Cl.[4] F27D *1/18*
U.S. Cl. 432—242 **19 Claims**



1. Apparatus for charging a melting furnace from a charging conveyor, the melting furnace having a charging opening in its sidewall, said charging apparatus comprising:

a support frame;

an upstanding housing mounted on said support frame;

a pivotally mounted receiving pan mounted on said support frame, and having a discharge chute on one side thereof, said discharge chute adapted to extend into the charging opening in the furnace sidewall;

said housing having a first opening in its sidewall for receiving material conveying means, and a second opening in its sidewall for receiving said discharge chute; and

means for moving said apparatus into the charging opening of said furnace and to a position remote therefrom.

4,681,538

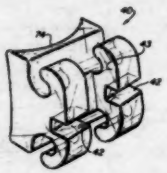
CRYSTALLINE ALUMINA COMPOSITES

Robert D. DeLuca, Pennington, and Robin M. Forbes-Jones, Titusville, both of N.J., assignors to Johnson & Johnson Dental Products, Company, East Windsor, N.J.

Division of Ser. No. 602,874, Apr. 23, 1984, Pat. No. 4,595,598. This application Dec. 9, 1985, Ser. No. 806,712

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—9 **5 Claims**



1. A method for applying orthodontic brackets to the teeth of a patient which comprises the steps of:

(a) providing a crystalline alumina orthodontic bracket comprising a base member including a tooth contacting surface and a body member extending from said base member, said body member including walls defining an archwire groove;

(b) coating said tooth contacting surface with a thin adherent coating of a siliceous material which consists essentially of silica or a glass containing at least 50 mol percent silica; and

(c) bonding said bracket to the surface of a tooth with an adhesive having an affinity to said thin adherent coating of siliceous material.

4,681,539

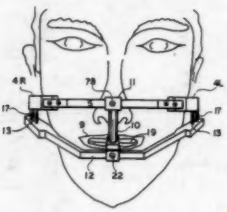
DENTAL ARTICULATOR AND METHOD

Florian J. Knap, 3000 Mount Hill Dr., Midlothian, Va. 23113

Filed Sep. 6, 1985, Ser. No. 773,035

Int. Cl.[4] A61C *19/04*

U.S. Cl. 433—73 **10 Claims**



1. Apparatus for forming a recording of the condylar motion of a dental patient and utilizing said recording for reconstructive purposes as part of a dental articulator, said apparatus comprising:

(a) a maxillary recording assembly adapted to fit the patient's upper jaw and having: (1) a first rigid U-shaped bow having a straight forward bar and two extremities positioned at equal distances rearwardly of said forward bar, (2) box-like downwardly opening receptacles removably attached to said rearward extremities, and (3) an upper bite plate pendantly attached to said forward bar and displaced rearwardly therefrom, said upper bite plate having a lower abutment surface and an upper surface having a tooth receiving trough,

(b) a mandibular recording assembly adapted to fit the patient's lower jaw while aligned below said maxillary recording assembly and having: (1) a second rigid U-shaped bow having a straight forward bar and extremities provided with posts perpendicularly adjustable with respect to said bow, (2) a smooth ball affixed to the uppermost extremity of each post and adapted to vertically enter the receptacles of said maxillary recording assembly, and (3) a lower bite plate attached to said forward bar and extending rearwardly therefrom, said lower bite plate having an upper abutment surface and a lower surface having a tooth receiving trough, the relative positioning of said bite plates within said assemblies being such as to permit sliding contact between said abutment surfaces,

(c) an upper articulator member comprised of a rigid plate having a center zone, and equal left and right side arms radiating from said center zone in a straight line path and terminating in distal extremities having means for attachment of the receptacles of said maxillary recording assembly, and

(d) a lower articulator member comprised of: (1) a floor plate having rear and forward extremities, (2) a cross bar positioned above the plate and parallel thereto adjacent said rear extremity, and (3) means for adjustably positioning paired posts above said cross bar, said posts having smooth balls attached to their uppermost extremities, whereby

(e) the maxillary and mandibular recording assemblies interact to produce a solid recording confined within said receptacles, and said receptacles can be attached to said upper articulator member in a manner such that said upper articulator member is pivotably supported by vertical interaction with the smooth balls associated with the cross bar of said lower articulator member.

4,681,540

DENTAL HANDPIECE ARRANGEMENT

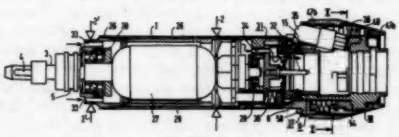
Hermann Landgraf; Werner Schuss, both of Heppenheim, and Rainer-Karl Worschischek, Lorsch, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,727

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3441024

Int. Cl.[4] A61C *1/08*

U.S. Cl. 433—126 **19 Claims**



1. In a dental handpiece arrangement having a drive motor with a drive shaft, a grip piece having a head housing with chuck means to hold and rotate a tool and a drive train extending in the grip piece to connect the drive shaft to the chuck means, the improvements comprising the drive motor being received in a cylindrical motor cartridge with the drive shaft extending out of a cylindrical coupling element at one end of the cartridge, said coupling element having a smaller diameter than the diameter of the cartridge, said cartridge having a tubular heel of a smaller diameter than the major portion of the cartridge at the other end for releasable connection with a pin member of a supply hose containing electrical leads and water and air lines, said motor cartridge having at least two cylindrical bearing surfaces axially spaced therealong for telescopically receiving internal bearing surfaces of a cylindrical sleeve which may be part of an adapter or part of a grip piece with an integral sleeve, said cylindrical sleeve having a coupling element cooperating with the cylindrical coupling element to form a latch means for securing the sleeve on the motor cartridge and allowing rotation of the sleeve thereon; and a

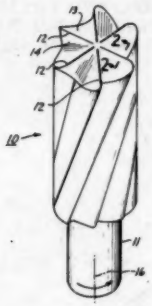
sleeve-shaped coupling member being received on the tubular heel for rotation thereon, said sleeve-shaped coupling member having means forming fluid coupling means for air and water discharging from the pin member and having fluid channels extending from the fluid coupling means to sockets for receiving ends of fluid conduits disposed in the cylindrical sleeve to form a fluid connection therewith so that the fluid is coupled through the coupling member, the sleeve member and into passages of the grip piece for discharge adjacent the chuck means and the coupling member and the sleeve member having coacting parallel extending surfaces to form a plug-like connection between the sleeve member and the coupling member as the sleeve member is telescopically received on the motor cartridge whereby the motor cartridge of the handpiece arrangement provides flexibility to receive both a grip piece which is mounted on a adapter having a cylindrical sleeve and a grip piece with an integral cylindrical sleeve.

4,681,541

DENTAL BUR WITH ENHANCED DURABILITY

Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107

Filed Jul. 5, 1985, Ser. No. 752,378
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—165 **16 Claims**



1. A dental bur having a substrate which includes surfaces provided as a pair which form an edge to cut dental tooth material which edge is sufficiently hard, and a layer deposited on said edge surfaces and surfaces adjacent to said edge surfaces said layer being formed of a material selected from the groups consisting of nitrides and carbides of titanium and tungsten, said layer being deposited on said edge surfaces and adjacent surfaces by vacuum deposition, arc deposition or cathode sputtering to produce a layer of thickness controlled to be insufficiently thick to form an unsuitably dull edge.

4,681,542

RETENTION SYSTEM FOR DENTAL PROSTHESIS

Lloyd Baum, 25742 Hinckley St., Loma Linda, Calif. 92354

Filed Feb. 18, 1986, Ser. No. 829,921
Int. Cl.[4] A61C *13/12, 5/08*
U.S. Cl. 433—172 **4 Claims**

1. An improved telescope retainer for dental prostheses comprising:

a coping affixed at a lower end to an abutment tooth, said coping having a coping axis and an upwardly tapering outer axial surface;

a groove in said axial surface encompassing said coping in a plane generally transverse to said coping axis;

an O-ring of elastomeric material stretched about said coping and elastically retained in said groove, said O-ring having a cross-sectional diameter substantially greater than the depth of said groove such that an outer portion of said ring projects from said axial coping surface; and

a prosthesis having a retainer cavity including a retainer surface closely telescopically mateable onto said axial coping surface, there being a complementary groove in said retainer surface shaped to closely match and receive

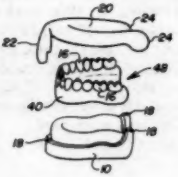
said outer portion of the O-ring, said O-ring thus making a resilient retentive interference fit between said prosthesis and said coping.

4,681,543

RAPID DENTURE TECHNIQUE

Enrique A. Monroy, Hialeah, Fla., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Feb. 14, 1986, Ser. No. 829,746
Int. Cl.[4] A61C *13/10*
U.S. Cl. 433—196 **17 Claims**



5. For use in the fabrication of artificial dentures, a custom-formed matrix adapted to be shaped from an elongated form of pliable light-curable plastic dental material shaped complementarily to the disposition of a set of artificial teeth set in wax on a dental model, the outer ends of said form being shaped for engagement with said model at the rear end thereof, and a support member of the same material as said elongated form affixed to said form mid-way of the ends thereof and extending transversely thereto, the free end of said support member being adapted to engage the front end of said model whereby in cooperation with said outer ends of said form a minimum of a three point support of said matrix upon a dental model is provided, said matrix being adapted to be impressed upon exposed incisal and occlusal surfaces of a set of artificial teeth mounted upon a model for releaseable connection of said teeth to said matrix for support of said teeth independently of said model when desired and said formed matrix being rendered rigid when light-cured with said teeth releasably connected thereto.

9. A technique for rapidly producing a finished dental prosthesis upon which at least one artificial tooth is mounted in life-like position; said technique comprising the steps of:

a. forming a denture base member in a configuration having a tooth receiving area;

b. applying a temporary set-up material to the denture base member tooth receiving area;
c. setting up at least one artificial tooth having a biting end and receiving area end upon said temporary set-up material in life-like position with the biting end of the tooth exposed and the receiving area end of said tooth engaged toward said tooth receiving area;
d. forming a matrix of pliable material into complementary shape of said life-like position;
e. impressing said matrix against the exposed biting end of said tooth to effect a releaseable connection of said tooth to said matrix;
f. providing positioning means for positioning the matrix relative to the denture base member;
g. curing said matrix to render the same rigid and manually maneuverable;
h. removing said tooth releaseably connected with the matrix and exposing the receiving area end of said tooth;
i. shaping pliable denture material to the tooth receiving area of the denture base;
j. impressing the exposed receiving area end of said tooth while it is connected releaseably with the matrix on said shaped denture material;
k. curing said shaped denture material with said tooth impressed thereon; and
l. separating the matrix from said tooth.

4,681,544

ORAL PACK RETENTION SYSTEM

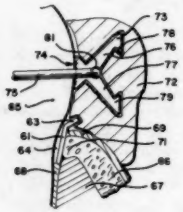
Albert J. Anthony, 45 Central St., West Boylston, Mass. 01583

Continuation-in-part of Ser. No. 457,762, Jan. 13, 1983, Pat. No. 4,533,326, Ser. No. 458,298, Jan. 17, 1983, Pat. No. 4,464,114, and Ser. No. 291,445, Aug. 10, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 762,932

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] A61C *5/00*

U.S. Cl. 433—215 **11 Claims**



1. An oral pack retention system for use in covering a location in the mouth which is adjacent a tooth, comprising:
(a) medication delivery means adapted to be placed at said location for delivering medication to the location,
(b) a mass of pack material adapted to be placed against said medication delivery means and said tooth for retaining the medication delivery means in position with respect to the location, and
(c) connecting means for connecting said mass of pack material to said tooth so that said mass of pack material remains in said medication delivery means retaining position.

4,681,545

METHOD FOR RAPID OBTURATION OF ROOT CANALS

Robert E. Lapcevic, 12451 Curry Ct., Saratoga, Calif. 95070

Continuation of Ser. No. 511,373, Jul. 5, 1983, abandoned. This application Jun. 23, 1986, Ser. No. 880,931

Int. Cl.[4] A61C *5/02*

U.S. Cl. 433—224 **15 Claims**

1. An improved filling point for sealing a prepared root canal cavity, said filling point having a length in the range from 10 to 30 mm and including an axial electrically resistive heating element which is fixedly imbedded within the filling point, whereby after sealing said root canal cavity with said filling point, said resistive heating element remains fixedly part of said filling point.

4,681,546

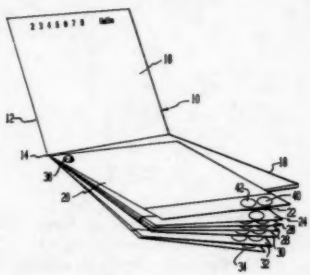
PERSONAL COLOR ANALYSIS METHOD

Charlavan Hart, 325 E. Pipeline, Bedford, Tex. 76021

Filed Jul. 20, 1984, Ser. No. 632,944

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—99 **16 Claims**



1. The method of coordinating the colors of an individual's wardrobe which comprises:
(a) color-spectrum analyzing the skin tones of an individual to determine the distribution and concentration of at least one preselected primary color of the colors in the individual's skin;
(b) categorizing the colors of wearing apparel and accessories into at least two classes of color tones based on the concentration of the preselected primary color in these colors; and
(c) selecting the class of wearing apparel and accessories for the individual having the concentration of the preselected color tones most closely matching the concentration of that preselected primary color in the individual's skin.

4,681,547

CERVICAL EXAM TEACHING METHOD

Marie Herron, 2300 Webster, #502, San Francisco, Calif. 94115

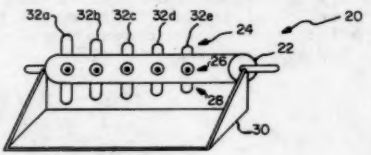
Filed Dec. 6, 1985, Ser. No. 805,615

Int. Cl.[4] G09B *23/30*

U.S. Cl. 434—273 **5 Claims**

1. A method of teaching cervical examination for the detection of preterm labor, the steps of the method comprising:
providing a multiplicity of models of the human female cervix;

arranging said models in a plurality or rows so that the models in each row differ from one another in at least one cervical characteristic selected from a preselected set of cervical characteristics which change during the course of preterm labor, wherein the progression of said models in



each row simulates the change in a different cervical characteristic or set of cervical characteristics during preterm labor; and

repetitively touching the models in each said row to learn the feeling of each said cervical characteristic during preterm labor.

4,681,548

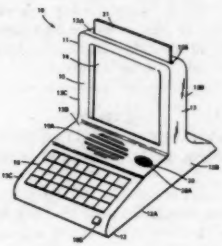
AUDIO VISUAL APPARATUS AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Feb. 5, 1986, Ser. No. 826,312

Int. Cl.[4] G09B *7/06*

U.S. Cl. 434—311 **20 Claims**



1. An interactive information system comprising:

(a) a support,

(b) means for supporting and predeterminately positioning a record member on said support, which record member contains visually readable indicia and a machine readable code recording extending parallel to an edge of said record member,

(c) means supported by said support for automatically reading the code recording of a record member which is predeterminately positioned on said support and generating electrical signals indicative of information defined by said code read,

(d) electronic computing means supported by said support for receiving and performing computing functions with respect to electrical signals received from said reading means when reading the machine readable recording of a record member,

(e) selectively operable control means operable by a person visually reading the indicia of a record member after it has been read by said reading means and supported by said support for controlling the operation of said electronic computing means in accordance with the signals generated by said reading means when it reads the machine readable recordings of a record member supported by said support, and

(f) means supported by said support and controlled by said electronic computing means for intelligibly indicating the results of the operations of said electronic computing means on the data received from said reading means and the operation of said selectively operable control means by the person reading the visually readable data of the record member read by said reading means.

4,681,549

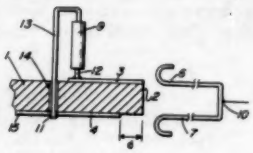
PRINTED CIRCUIT BOARD EDGE CONNECTION ARRANGEMENTS

Olav Peterson, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 14, 1982, Ser. No. 398,248

Int. Cl.[4] H01R *13/53*

U.S. Cl. 439—181 **6 Claims**



1. A printed circuit board edge connection arrangement comprising a printed circuit board having first and second edge connection pads and a connector for removably receiving the board, the connector including a first contact for making a first electrical connection to the first pad, and a second for making a second electrical connection to the second pad, when the board is received in the connector, wherein the second pad does not extend as far towards the connection edge of the printed circuit board as the first pad, whereby the first contact makes the first electrical connection to the first pad on insertion of the board into the connector before the second contact makes the second electrical connection to the second pad, and the first contact breaks the first electrical connection to the first pad on removal of the board from the connector after the second contact breaks the second electrical connection to the second pad, and current-limiting means, connected between the first and second pads or between the first and second contacts, via which the first electrical connection is connected in parallel with the second electrical connection when the board is received in the connector, whereby arcing between the second contact and the second pad, on insertion of the board into and removal of the board from the connector, is avoided.

4,681,550

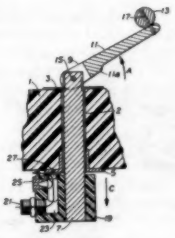
AQUATIC RIDE

Dean B. Koenig, 3297 Marilyn Ct., Pleasanton, Calif. 94566

Filed Oct. 11, 1985, Ser. No. 786,581

Int. Cl.[4] B63H *11/107, 11/113*

U.S. Cl. 440—40 **19 Claims**



4. An aquatic ride for use in swimming pools or the like of the type having a high water pressure source and line to power

a pool cleaning apparatus associated therewith, comprising in combination:

a means for supporting a person in the pool,

a water outlet means on said supporting means operatively and removably connected to the high pressure line, and

valve means interposed between said outlet means and the high water pressure source whereby said supporting means is guided by controlling pressure water through said outlet means, said high pressure line, outlet means and valve means are united to a housing having a passageway,

wherein said housing passage way is substantially L shaped, a first outlet disposed at a vertical top most extremity of one leg of said L shaped passage way adapted to bar against a bearing surface of a bottom face of said support means, and a second outlet parallel to but horizontally offset from a horizontal other leg of said L shaped passageway which connects to the high pressure line.

4,681,551

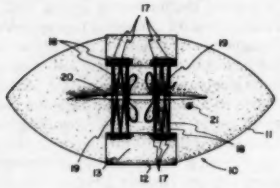
AQUATIC DEVICE

Richard S. Morris, 817 Orleans Pl., Raleigh, N.C. 27609

Filed Nov. 4, 1985, Ser. No. 798,247

Int. Cl.[4] A63C *15/02*

U.S. Cl. 441—76 **4 Claims**



1. A water-walking apparatus comprising: a donut-shaped tube; cinch means for compressing said donut-shaped tube into a double-ended, canoe-like configuration, said cinch means including an elongated band extending around said tube, the opposite ends of said band including adjustable attachment means for drawing one end of said band towards the other end to compress said tube; and a plurality of downwardly projecting, angularly disposed propulsion means secured to said cinch means to allow said water-walking apparatus to move more readily in one direction than in the opposite direction whereby an improved water-walking apparatus is provided.

4,681,552

COMBINED LIFE VEST DEVICE AND BUOYANCY COMPENSATOR

William L. Courtney, 3000 Steiner St., San Francisco, Calif. 94123

Filed Jun. 20, 1985, Ser. No. 747,005

Int. Cl.[4] B63C *9/16, 9/18*

U.S. Cl. 441—92 **22 Claims**

1. A combined life vest device and buoyancy compensator for use by divers along with scuba gear including a compressed air tank to provide an under water source of air, backpack means for mounting the tank on the diver and quick release means for securing the back pack means to the diver and permitting the diver to rapidly free himself of both the backpack and the tank, comprising

a garment adapted for fitting about the torso of the diver,

buoyancy compensator means comprising a first air-tight chamber formed in the garment closely adjacent the location of the air tank on the diver,

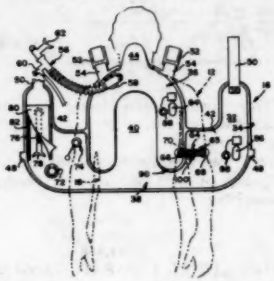
means for permitting the diver to selectively regulate pressure within the buoyancy compensator chamber,

a second air-tight chamber formed in the garment to generally surround a portion of the diver's torso, and

means for selectively inflating the second chamber,

whereby the diver is able to regulate pressure within the first buoyancy compensator chamber during a dive, the location of the buoyancy compensator being arranged closely adjacent the tank to maintain the diver's underwater center of gravity while also being in a position to avoid restricting movement of the diver, the second chamber being inflated only as necessary or desired by the diver,

the first and second air-tight chambers being of complementary nested configuration,



the second air-tight chamber being of a W configuration including an elongated central element arranged to extend along the diver's back and elongated lateral elements arranged to be generally adjacent the front of the diver's torso, the first air-tight chamber being of an inverted U configuration to nest about the elongated central element of the second air-tight chamber in order to be closely adjacent the air tank on the diver.

4,681,553

AERODYNAMIC THROWING IMPLEMENT

Michael R. Rodarte, 12371 Nutwood St., Garden Grove, Calif. 92640

Continuation-in-part of Ser. No. 493,031, May 9, 1983, Pat. No. 4,516,946. This application Feb. 28, 1985, Ser. No. 707,019

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] A63H *27/00*

U.S. Cl. 446—46 **7 Claims**

1. A hand-launchable gyroscopic flight disc comprising:

a disc-shaped body having a centrally located aperture and a shoulder on its top surface about said aperture;

a center dome surface member having a generally convex top surface, a convex bottom surface and a circumferential periphery with respect to the disc axis; and

means for peripherally and freely rotatably coupling said center dome to said disc-shaped body within said aperture and radially interior to said shoulder, said coupling means including a first bearing journal about said aperture and radially interior to said shoulder, a second bearing journal about said circumferential periphery of said center dome for cooperating with said first journal to provide a ball-bearing race, and ball bearings disposed within said ball-bearing race;

said center dome, said coupling means and said shoulder being mutually configured so as to provide a generally continuous aerodynamic contour with respect to said top surface; and

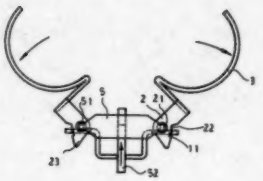
said center dome and said coupling means being mutually configured so as to be generally flush with the bottom surface of said disc body and to provide an axial cavity with respect to the bottom surface of said disc.

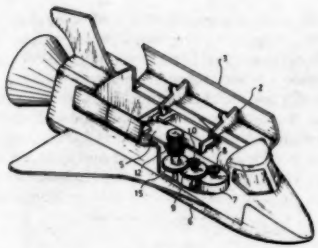
4,681,554

TOY DEVICE WHICH CAN BE OPENED AND POSITIONED AT ANY DESIRED ANGLE

Chang Hsien-Yang, Fl. 2, No. 2-2, Lane 762, Ding Chou Rd., Taipei, Taiwan

Filed Dec. 30, 1985, Ser. No. 814,380
Int. Cl.[4] A63H *27/20, 31/02*
U.S. Cl. 446—231 **2 Claims**





1. A toy device able to be opened and positioned at any angle desired comprising:

a fixed member having two ends, of which the both ends are furnished with notches to receive a transmission member in each of said notches;

transmission members, each of which is mounted in a respective one of said notches in a vertically movable manner, each of said transmission members is also furnished with a round hole, and also furnished at one side with a notch, and each of said transmission members has a pointed end in a lower portion;

two movable members, each of which is formed into a semicircular shape, and being fixedly connected with a top portion of a respective one of said transmission members; and the slanting movement of said transmission members can control said movable members to open outwards;

an actuation means, said actuation means comprising a guide plate;

a control member having two ends, of which the both ends are furnished with lugs respectively for hooking into the round holes of said transmission members respectively so as to connect together with said transmission members; and in the center bottom of said control member, there is mounted a guide plate which is able to be driven to move up and down so as to actuate said transmission members to move up and down simultaneously; and

upon said guide plate being driven to move upwards said control member actuates said transmission members to move upwards; said transmission members move upwards until said notch on respective ones of said transmission member is engaged with said notch on said fixed member, and then said transmission members slantingly move outwards and actuate simultaneously said movable member to open at an angle; and said movable member will fully be opened at an angle of 180° with respect to the other one of said movable members; wherein said movable member will be fully open upon a respective lower edge of said notches of said transmission members being retained by the edge of the notch on said fixed member; and said movable member may be positioned at a given angle desired by controlling said guide plate at a position corresponding to the angle desired.

4,681,555

PUPPET OR DOLL HAVING STRUCTURE PROVIDED BY STUFFING

Edna C. Nativ, 15718 Levan, Livonia, Mich. 48154

Filed Apr. 25, 1986, Ser. No. 855,744
Int. Cl.[4] A63H *3/14*
U.S. Cl. 446—327 **13 Claims**

9. A somewhat flexible, soft-bodied doll having a body, a head affixed to said body, a pair of arms affixed to said body, a sleeve enclosing each of said arms, and a pair of legs affixed to said body; said body, head and sleeves possessing interior surfaces, and said arms possessing exterior surfaces, which surfaces together define a substantially continuous cavity in said doll, said cavity being dimensioned to receive the hand of a wearer therein; such that said head, arms and legs are rigidified solely by stuffing therein; and wherein the portions of said cavity defined by said arms and sleeves are disposed posteriorly of said arms.

4,681,556

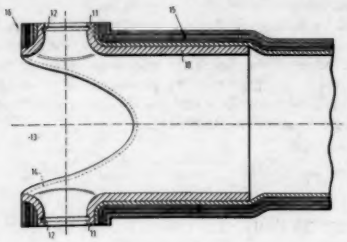
ASSEMBLY OF COMPOSITE SHAFT AND YOKE MEMBER OF A HOOKES UNIVERSAL JOINT

Bertram J. Palmer, Barton Under Needwood, Great Britain, assignor to BRD Company Limited, Walsall, England

PCT No. PCT/GB84/00073, § 371 Date Oct. 29, 1984, § 102(e) Date Oct. 29, 1984, PCT Pub. No. WO84/03544, PCT Pub. Date Sep. 13, 1984
PCT Filed Mar. 8, 1984, Ser. No. 668,727
Claims priority, application United Kingdom, Mar. 9, 1983, 8306543
Int. Cl.[4] F16C *7/00, 1/02*
U.S. Cl. 464—181 **6 Claims**

1. An assembly of a shaft of composite, fibre reinforced resin material and a yoke member of a Hookes universal joint, the yoke member comprising a sheet metal element having a spigot portion extending axially of the shaft and two diametrically opposed tubular portions extending transversely thereof and adapted to form or receive bearing elements of the joint, the

shaft including fibres would around said spigot portion and fibres wound around said tubular portions, at least some of said



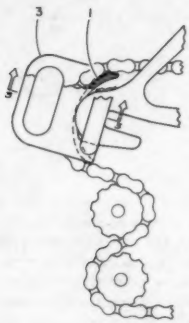
fibres extending continuously around said spigot portion and at least one of said tubular portions.

4,681,557

HOLDER FOR BICYCLE CHAINS

Tom V. Hillman, 528 Temple Hills Dr., Laguna Beach, Calif. 92651

Filed May 30, 1986, Ser. No. 868,613
Int. Cl.[4] F16H *7/24*
U.S. Cl. 474—119 **2 Claims**



1. An article of manufacture for retaining a bicycle drive chain to a bicycle dropout with or without a bicycle rear wheel in place comprising, an outwardly curved channel shaped chain retainer, and an elongated box shaped dropout receiver, wherein said chain retainer and said dropout receiver are attached side by side at their respective ends and said box shape forms a recess which is in the same direction as the concave underside of said chain retainer.

4,681,558

REINFORCED POLYMERIC COMPONENT AND METHOD OF MANUFACTURE

Doyle W. Rausch, Niles, Mich., assignor to National Standard Company, Niles, Mich.

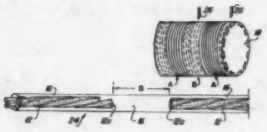
Filed Apr. 18, 1985, Ser. No. 724,604
Int. Cl.[4] F16G *5/10*
U.S. Cl. 474—205 **84 Claims**

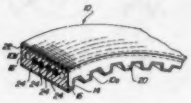
1. A reinforced polymeric belt construction comprising: a gear-tooth engaging portion, a reinforcing material portion positioned about said gear-tooth engaging portion, said reinforcing material portion being comprised of a continuous length of a reinforcing member and a continuous length of a carrier member having a length greater than said reinforcing member, with said reinforcing member having a Young's modulus value greater than said carrier member, and wherein said reinforcing material portion includes a plurality of spiral wraps of said reinforcing member with at least a portion of one wrap on each side of t he wraps of said reinforcing member being comprised of said carrier member, and a layer of covering material positioned about said reinforced material portion.

50. A method of manufacturing a cylindrical reinforced polymer component comprising the steps of:

forming a cylinder of polymeric matrix material;

winding spirally on said cylinder of polymeric matrix material in reinforcing filament material comprised of a plural-





ity of discontinuous lengths of a reinforcing member portion and a continuous length of a carrier member portion operatively connected to said reinforcing member portion to provide a predetermined number of windings having said reinforcing member portion and said carrier member portion therein extending around said cylinder and a predetermined number of windings having said carrier member portion extending around said cylinder; and

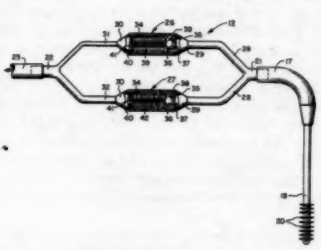
applying a cover layer over said wound cylinder material to provide a cylindrical reinforced polymer component.

4,681,559

PLURAL VALVE THREE STAGE PRESSURE RELIEF SYSTEM

Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,781
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—9 **19 Claims**



1. A valve for controlling the passage of body fluids from a first location in the body to a second location, comprising:

catheter means for removing a fluid from said first body location;

drain means for discharging said fluid to said second location;

first and second fluid passages in parallel fluid flow communication between said catheter means and said drain means;

said first fluid passage having a first valve means for regulating fluid flow through said first fluid passage, wherein said

first valve means opens at a first predetermined pressure, said first fluid passage also having fluid flow restrictor means for resisting sudden increases in flow rate through said valve; and

said second fluid passage having a second valve means for regulating fluid flow through said second fluid passage wherein said second valve means opens at a second predetermined pressure greater than said first predetermined pressure.

4,681,560

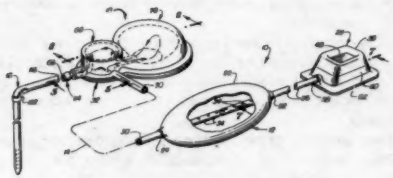
SUBCUTANEOUS INFUSION RESERVOIR AND PUMP SYSTEM

Rudolf R. Schulte, Santa Barbara; Gary P. East, and Alfons Heindl, both of Goleta, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Santa Barbara, Calif.

Continuation-in-part of Ser. No. 590,349, Mar. 16, 1984, Pat. No. 4,588,394. This application Apr. 11, 1986, Ser. No. 850,943

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—9 **20 Claims**



1. A subcutaneous infusion reservoir and pump system, comprising:

means for receiving medication into said system by injection;

a reservoir for storing medication injected into said receiving means, said reservoir including a reservoir inlet in fluid communication with said receiving means, and a reservoir outlet;

a normally closed valve capable of being opened to fluid flow therethrough by percutaneous manual manipulation and having a valve inlet in fluid communication with said reservoir outlet, a valve outlet, a resiliently flexible housing, a rigid floor plate underlying said housing to form an inlet chamber therebetween in fluid communication with said valve inlet, an outlet chamber within said housing, said outlet chamber overlying said inlet chamber, a valve passageway situated directly between said inlet and outlet chambers, said valve passageway permitting fluid flow between said inlet and outlet chambers, a valve diaphragm situated within said inlet chamber and resiliently biased to cover said valve passageway, said valve diaphragm normally forming a seal with a portion of said valve surrounding said valve passageway to prevent the flow of fluid through said normally closed valve unless forceably displaced, and a diaphragm displacement finger extending downwardly from the ceiling of said outlet chamber, said diaphragm displacement finger being situated and configured to displace said valve diaphragm and open said normally closed valve to fluid flow therethrough when moved downwardly through said valve passageway;

a pump having a pump inlet in fluid communication with said valve outlet, a pump outlet and a resilient crown defining at least a portion of said pumping chamber, said pump being manually actuable by the selective application of percutaneous pressure to depress said crown;

means for occluding said pump outlet when said normally closed valve is opened to fluid flow therethrough, said means for occluding including an occluder wall overlying the top portion of said housing of said normally closed valve, said occluder wall defining, in connection with the adjacent portion of said housing, a fluid exit passageway in communication with said pump outlet, said occluder wall preventing the flow of fluid through said fluid exit passageway when pressed against the adjacent portion of said housing; and

a catheter for directing medication to a specific location within the body, said catheter having a catheter inlet in fluid communication with said pump outlet.

4,681,561

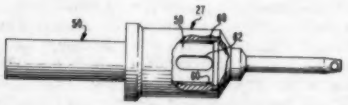
ULTRASONIC DECOUPLING SLEEVE

Larry L. Hood, Laguna Hills, and Maurice M. Imonti, Dana Point, both of Calif., assignors to CooperVision, Inc., Palo Alto, Calif.

Filed Jan. 24, 1986, Ser. No. 822,277

Int. Cl.[4] A61F *2/32*

U.S. Cl. 604—22 **27 Claims**



1. In a surgical instrument having an ultrasonically actuated surgical tool coupled to a source for ultrasonically vibrating the tool and a cap member defining a fluid conduit for flowing fluid to a surgical site for said tool, a portion of said tool extending in said conduit, the improvement comprising, in combination therewith, an impeding means located in said fluid conduit intermediate said tool portion and said cap member for impeding transmission of ultrasonic energy through a fluid in said fluid conduit,

said impeding means comprising a decoupling sleeve located within said cap member about a portion of said surgical tool and within said fluid conduit for flowing irrigation fluid to said surgical site, and

said decoupling sleeve including an axially-extending body portion positioned about an axially-extending portion of said surgical tool and defining at least an opening in a wall of said body portion for permitting fluid transfer from a position within said conduit exterior to said wall to a position interior to said wall within said sleeve.

4,681,562

METHOD AND APPARATUS FOR ASPIRATING SECRETED FLUIDS FROM A WOUND

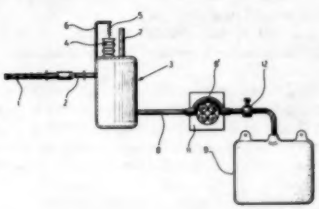
Walter Beck, Obere Hüslibachstr. 87, CH-8700 Küsnacht; Siegfried Berger, Wernau, and Margrit Werner, Lion-Feuchtwanger-Str. 69, 6500 Mainz-Hechtsheim, all of Fed. Rep. of Germany, assignors to Walter Beck and Margrit Werner, both of, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 798,845

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3441891

Int. Cl.[4] A61M *31/00*

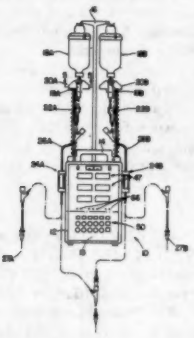
U.S. Cl. 604—54 **10 Claims**



1. A method for aspirating secreted fluids from a wound comprising the steps of:

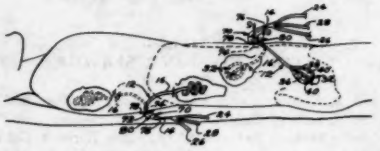
providing a drain connected to a first container by a first tube to form a closed system;
providing a second container connected to said first container by a second tube;
providing a tube pump and tube clamp on said second tube;
inserting said drain into the wound and closing said wound;
evacuating said first container by operating said tube pump to achieve a negative pressure in said first container;
closing said tube clamp and stopping the operation of said tube pump;
maintaining a negative pressure in said container;
periodically regenerating the negative pressure in said first container as the secreted fluids flow into said first container to a predetermined value while maintaining said system closed during the regenration phase, wherein at least a portion of the content of the first container is aspirated and pumped into said second container during the regeneration phase, and wherein the content of said first container aspirated therefrom is led through said second tube into said second container, said second tube being subjected to the effect of said operating tube pump and said tube clamp being open whereby said collection takes place in a closed system.

4,681,563
FLOW CONTROL SYSTEM
Clinton Deckert, and Larry L. Wilson, both of Poway, Calif., assignors to Centaur Sciences, Inc., Stamford, Conn.
Filed Apr. 26, 1985, Ser. No. 727,840
Int. Cl.[4] A61F 2/00
U.S. Cl. 604—67 **8 Claims**



1. A flow sensor for detecting the drop rate in an associated drip chamber of an infusion system comprising:
infrared light emitting means to generate an infrared light path;
sensor means interposed in said light path to detect the level of light passing therein and continuously generate a first signal indicative thereof;
pulsing means to periodically energize said light emitting means to produce a series of energized and non-energized states;
difference means to determine the difference between said first signal when said light emitting means is energized and said first signal when said light emitting means is not energized and generate a second signal indicative thereof;
reference means to establish a reference level for said second signal;
detection means to detect a pre-established deviation of a second signal from said reference level and produce a third signal indicative thereof; and
output means to produce an output pulse in accordance with said third signal.

4,681,564
CATHETER ASSEMBLY HAVING BALLOON EXTENDED FLOW PATH
Michael D. Landreneau, Mai Kai Apt. #29, 300 Samfor Ave., Shreveport, La. 71103
Filed Oct. 21, 1985, Ser. No. 789,821
Int. Cl.[4] A61M 29/02, 31/00
U.S. Cl. 604—97 **7 Claims**



1. A catheter assembly for insertion through a surgical opening into an interior body space for enabling a fluid to be introduced into said body space and for enabling unwanted flowable material to be drained from said body space including fluid after the same has been introduced therein, said catheter assembly comprising
an elongated flexible tubular structure having an exterior end section, an opposite interior end section operable to be inserted within a body space and three separate fluid passages extending within said exterior and interior end sections,
a balloon structure carried by the interior end section of said tubular structure in communication with a first of said three separate passages,
a second of said three separate passages having inlet opening means communicating therewith at the exterior end section of said tubular structure through which fluid is introduced and outlet opening means communicating therewith at the interior end section of said tubular structure through which fluid introduced through said inlet opening means is introduced into said body space,
a third of said three separate passages having drain opening means communicating therewith at the interior end section of said tubular structure through which fluid and/or unwanted flowable material in the body space can pass and discharge opening means communicating therewith at the exterior end section of said tubular structure through which fluid and/or flowable material passing through said drain opening means is discharged,
said first passage having inflation opening means communicating therewith at the exterior end section of said tubular structure through which inflating fluid is received for passage into said balloon structure to inflate the same after the interior end section of said tubular structure has been inserted into said body space so as to cause fluid passing into the body space through said outlet opening means to follow a more extensive flow path within said body space in order to reach said drain opening means and said drain opening means to be maintained substantially operationally free of obstruction by tissue defining said body space than is the case when said balloon structure is deflated within said body space immediately following insertion therein or just prior to withdrawal therefrom,
said balloon structure being configured so that in the inflated condition thereof within said body space the inflated surfaces thereof include outer portions facing toward the walls defining the body space and inner portions defining flow paths directed inwardly from the walls defining the body space,
the interior end section of the tubular structure defining the second passage communicating with said outlet opening means being carried by the outer surface portions of said balloon structure so that the fluid passing therethrough enters the body space adjacent the walls thereof and is confined to flow therealong until reaching an inwardly

directed flow path defined by said balloon structure inner portions,

the interior end section of said tubular structure defining the third passage leading from said drain opening means being disposed at the central interior of said balloon structure so that said drain opening means receives fluid after passing along the inwardly directed flow paths defined by the inner surface portions of said balloon structure.

4,681,565

METHOD AND APPARATUS FOR AUTOMATICALLY TREATING ANIMALS, PREFERABLY BIRDS, SUCH AS YOUNG CHICKS, YOUNG GUINEAFOWLS, YOUNG TURKEYS

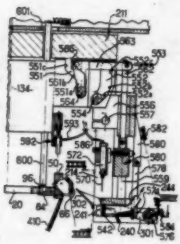
Albert J. A. Gourlandt, Les Grésillons, 78950 Gambais, France

Filed Dec. 26, 1984, Ser. No. 686,246

Claims priority, application United Kingdom, Dec. 30, 1983, 8334631

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—115 **5 Claims**



1. Apparatus for automatically treating animals such as birds at a high speed, comprising:

a frame,

a spindle mounted on said frame,

drive means for rotating said spindle,

a table mounted on said spindle and provided with a plurality of spaced-apart bird supports, each bird support comprising means for supporting the bird immobilized in the neck area,

movable support means freely mounted on said spindle for moving with respect to said frame from a non-operative position to an operative position,

means for administering a substance to said animals, said means being linked to said movable support means and comprising,

a syringe,

a suction device comprising a perforated nozzle provided with a perforated surface means for surrounding and extending vertically along the neck area retained in the bird support for the purpose of drawing back a predetermined area of the neck skin before an injection is made by said syringe, and

a safety device for preventing administration of the substance when no animal is held in a said bird support, said safety device comprising a feeling member attached to said movable support means and a stop member means for blocking entrance of said feeling member through an opening in said table when no animal is retained in said bird support.

4,681,566

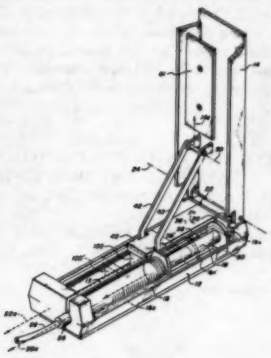
INFUSION DEVICE

Paul V. Fenton, Jr., Marblehead, Mass.; Robert L. Miller, New Providence, N.J., and Ernest M. Santin, Salem, Mass., assignors to Strato Medical Corporation, Beverly, Mass.

Filed Nov. 30, 1984, Ser. No. 676,728

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—135 **11 Claims**



1. An infusion device adapted for coupling to a syringe having an elongated tubular wall extending along a tube axis witha fluid dispensing opening at one end and having an internal plunger adapted for motion along said tube axis, said device comprising spring driving means for driving said plunger over a predetermined range of motion along said tube axis in response to an applied force, means for generating at least two substantially constant, spring generated forces, means for selectively coupling said force generating means, including means for generating said applied force and for applying said applied force to said spring driving means by selectively coupling one or more of said spring-generated forces to said spring driving means, said spring-driving means being operative when said syringe is coupled to said device in an operating position, and being inoperative otherwise.

4,681,567

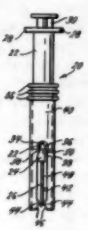
SYRINGE WITH SAFETY SHEATH

Edwin J. Masters, 142 Autumn, Sikeston, Mo. 63801, and Paul L. Ebaugh, 1553 Lexington, Cape Girardeau, Mo. 63701

Filed Apr. 3, 1986, Ser. No. 847,757

Int. Cl.[4] A61M 5/32

U.S. Cl. 604—198 **22 Claims**



1. An improved syringe of the type comprising a barrel having a needle extending from the lower end, the improvement comprising:

at least one knob extending outwardly from the barrel near the lower end;

a sheath slideably mounted on the barrel and slideable between a retracted position over the barrel in which the sheath does not obstruct access to the needle and an extended position at least partly over the needle in which the sheath obstructs access to the needle;

at least one longitudinal slot means in the sheath for receiving the knob, the slot means having means for releasably retaining the sheath in its retracted position, said releasable retaining means being releasable upon downward pressure applied to the sheath, the slot means further having means for lockingly engaging the knob to lockingly engage the sheath in the extended position.

4,681,568

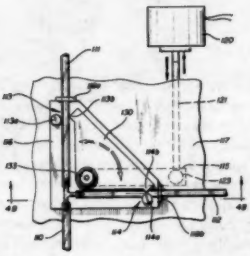
VALVE APPARATUS FOR PHOTOACTIVATION PATIENT TREATMENT SYSTEM

Vernon H. Troutner, St. Petersburg, Fla., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 665,827, Oct. 29, 1984, Pat. No. 4,596,547. This application Feb. 27, 1986, Ser. No. 834,303

Int. Cl.[4] A61M *5/005*

U.S. Cl. 604—250 **7 Claims**



1. Apparatus for controlling the flow of fluids through a flexible tube for use in a photoactivatable agent patient treatment system comprising:

(a) actuator means for supplying force in response to a signal:

(b) clamping means movably mounted on a work surface;

(c) post means mounted on said work surface adjacent to said clamping means whereby flow through said flexible tube, placed therebetween, may be reduced by movement of said clamping means toward said post means thereby compressing said flexible tube;

(d) motion translator means, associated with said clamping means through a manually disengagement rotation clamp means, for moving said clamping means in response to force supplied by said actuator means, wherein the manually disengageable rotation clamp means comprises,

(1) an outer collar and an inner collar rotatable therein, wherein the inner collar is fixedly associated with said motion translator means and said outer collar is fixedly associated with said clamping means;

(2) at least one locking element means associated with said inner collar and not said outer collar when said locking element means is in a first position, said locking element means associated with said inner and outer collar when in a second position wherein said locking element means is received by said outer collar, said association in said second position acting to prevent rotation of said inner collar in said outer collar;

(3) manually engageable locator means for moving said locking element means from said first position to said second position; and

(4) resilient biasing means for urging said locator means to move said locking element means to said second position whereby force supplied by said actuator means through said motion translator means is transferred to said clamping means and wherein movement of said locator means against said resilient biasing means allows said locking element means to move from said second position to said first position upon manual movement of said clamping means; and

(d) actuator bar means having one end connected to said actuator means and the other end associated with said motion translator means for communicating said actuator means supplied force to said motion translator means.

4,681,569

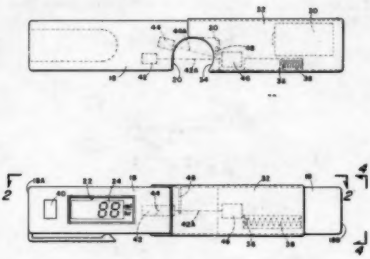
IV RATE METER

Stephen J. Coble, 11001 Leolang Ave., and Edward J. Arkans, 8835 Mulberry Dr., both of Sunland, Calif. 91040

Filed Mar. 22, 1985, Ser. No. 715,162

Int. Cl.[4] A61M *5/165*

U.S. Cl. 604—253 **3 Claims**



1. A rate meter for use with an IV fluid administration system which includes a vertical transparent cylindrical drip chamber, comprising:

an elongated housing formed of a base portion having a first end and a second end and a moveable portion, the base portion having a notch therein intermediate said housing ends and of depth less than the thickness of said housing base portion, one surface area of the notch being configured to engage a portion of the external surface of a drip chamber, the moveable portion being slideable between an open and a closed position, the housing moveable portion being of generally thin tubular configuration substantially surrounding said base portion and slideable on said housing base portion between said notch and said first end, the housing base and moveable portions providing a member of generally uniform cross-sectional configuration throughout the length thereof except for the notch therein when said moveable portion is slid to said open position, that is, towards said base portion first end to receive a cylindrical drip chamber therein, the moveable portion having an end surface configured to engage a portion of the external surface of a cylindrical drip chamber, whereby a drip chamber may be received in said notch when said moveable portion is in the open position;

resilient means biasing said moveable portion towards the closed position whereby a cylindrical drip chamber received in said notch is engaged by said moveable portion to removeably attach said housing to a cylindrical drip chamber; and

means within said housing for detecting drops of IV fluid passing through said drip chamber and for displaying the rate of fluid flow.

4,681,570

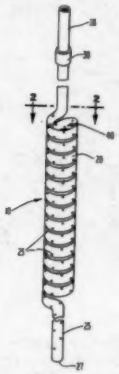
PERITONEAL CATHETER

Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203

Filed Dec. 26, 1985, Ser. No. 813,418

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—282 **10 Claims**



1. A body-implantable catheter especially suited for percutaneous communication with the peritoneal cavity which comprises

a flexible, elongated tube with perforations in the wall thereof to pass fluid to or from the lumen of said tube, and protrusions within said lumen to prevent collapse of said tube under a negative pressure gradient; together with

means acting on said tube for urging at least a central portion of said tube into a tightly wound cylindrical helix configuration with closely spaced windings, providing a secondary fluid channel enclosed by said helix;

whereby pressure in said tube, impelling said helix to unwind, tends to free said perforations from occluding organic deposits, and said secondary fluid channel, created upon restoration of the tightly wound helix, serves as a sump for spent fluid.

4,681,571

SUCTION CANISTER WITH DISPOSABLE LINER AND CHECK VALVE

John R. Nehring, East Greenwich, R.I., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Apr. 23, 1981, Ser. No. 256,711

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—320 **7 Claims**

1. A medical suction canister for receiving fluid from a patient during a fluid suctioning procedure under the force of vacuum created by a vacuum source, said canister comprising:

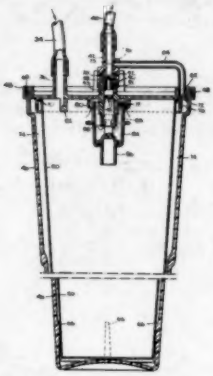
(a) a housing;

(b) a flexible liner disposed within the housing, a void space being formed between the outside of the liner and the inside of the housing;

(c) fluid path means for conducting fluid from the patient to the inside of the liner;

(d) vacuum path means for applying suction (i) to the inside of the liner to cause fluid from the patient to flow into the liner and (ii) to the void space to remove gas therefrom; and

(e) check valve means located in the vacuum path means (i) for expanding the flexible liner when suction is initially applied by the vacuum path means to the inside of the liner and to void space and (ii) for keeping the flexible liner expanded during the suctioning procedure, said check valve means oriented to permit gas to leave the inside of the liner and flow to the vacuum source and to block the



reverse flow of gas from the vacuum source void space into the liner.

4,681,572

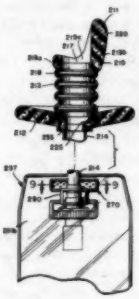
FEMALE URINARY INCONTINENCE DEVICE

Joseph S. Tokarz, Schaumburg, and Marvin E. Jensen, Niles, both of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 417,140, Sep. 13, 1982, abandoned. This application Jul. 27, 1983, Ser. No. 516,931

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—329 **18 Claims**



1. A female urinary incontinence device comprising an external pad of flexible, resilient material for externally contacting the libia majora of a wearer, said pad having an opening therethrough; a periurethral cup molded of soft compressible material and having an upper opening defined by smoothly-rounded contact surfaces adapted to engage the periurethral floor and vaginal intriotus of a wearer; said compressible material having a durometer within the range of about 1 to 30 on the Shore A scale; said cup also having a lower opening; compressible tubular elastic bellows means extending between said lower opening of said cup and said opening of said pad for urging said cup into engagement with said periurethral floor and vaginal intrioitus when said pad is held against the labia majora and said bellows means is in a state of partial compression; conduit means extending into said opening of said pad and joined to, and in fluid communication with, the lower end of said bellows; said conduit means including a wall having a vent port extending therethrough with said port located immedi-

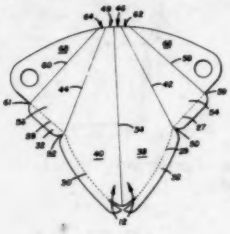
ately adjacent said external pad and the lower end of said bellows; and one-way valve means at said port for allowing air to enter said bellows and cup, as liquid travels away from said bellows through said conduit means, while at the same time preventing the escape of liquid through said port.

4,681,573

FEMININE URINARY DEVICE

Lore H. McGovern, Nashua, N.H., and Alix A. Moore, Santa Anna, Calif., assignors to Aplex Corporation, San Mateo, Calif.

Filed Oct. 29, 1985, Ser. No. 792,517
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—329 **5 Claims**



1. A collapsible, disposable urinary device for a standing female erected substantially from a curvilinear creased or scored blank of a plaitable or foldable at least temporarily fluid resistant material into an oblique conical like form for surrounding and channeling but not otherwise interrupting the urine-stream of said female and for directing said stream through open space a comfortable distance away from the front of said female; said form comprising during use:

a bottom having a bottom edge and two substantially identical bottom walls continuous with and extending upwardly and outwardly from both sides of said bottom edge, said bottom walls each having a downwardly, forwardly slanting upper edge, a front edge and a rear edge, said rear edge and said upper edge of each bottom wall converging at an apex with each said rear edge sloping diagonally downwardly and backwardly from said apex and each said rear edge having an outwardly extending flap with a front and rear portion, said rear portion being partially detached from said rear edge;

a top having two substantially identical top walls, each top wall being integral with said upper edge of said bottom wall, each said top wall having a downwardly forwardly slanting top edge, a front edge and a rear edge with said rear edge and said top edge converging at an apex and each said rear edge having an outwardly extending flap with a front and rear portion, each said top wall beginning at the corresponding bottom wall apex and being continuous with the upper edge of said bottom wall, said top walls extending upwardly and inwardly from said upper edges of said bottom walls with said top wall top edges converging towards a vertical plane which intersects said bottom edge;

two substantially identical handles, each handle beginning at the corresponding apex of a top wall and being continuous with the upper edge of said top wall, said handles being substantially congruently joined substantially within said vertical plane;

a front discharge opening formed substantially by the front edges of the top and bottom walls; and

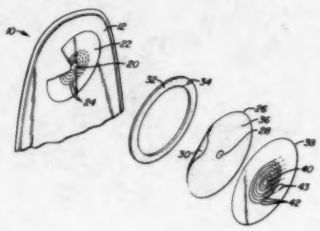
a diagonally, downwardly, backwardly slanting rear opening formed substantially by the rear edges of the top and bottom walls said rear opening shaped so as to surround the labia major of said female.

4,681,574

OSTOMY APPLIANCE WITH FLEXIBLE MEMBRANE CONNECTOR

Dianne Eastman, Kensington, Calif., assignor to Dianne Eastman Revocable Trust, Kensington, Calif.

Continuation-in-part of Ser. No. 531,518, Sep. 12, 1983. This application Feb. 7, 1986, Ser. No. 827,795
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—344 **9 Claims**



1. An ostomy appliance comprising:

a bag having an opening for receiving material from a stoma,

a thin, flexible membrane having a bag side and a skin side, the membrane having an inner portion connected to the bag circumscribing the opening and an outer portion which is adapted to be supported on the user's skin with the bag side exposed to the air,

adhesive means on the skin side of the membrane for attaching the membrane to the peristomal area of the user, said outer portion of said membrane with said adhesive means thereon adapted to transmit weight from the ostomy appliance to the skin of the user, and

a cover sheet overlying the adhesive means on the skin side of the membrane, the cover sheet being removable to expose the underlying adhesive means for attachment of the membrane and the bag to the peristomal area,

said membrane and adhesive layer having:

a combined thickness of less than about ten thousandths of an inch,

a combined elasticity coefficient of less than about 1.6 pounds per inch at 20% elongation, and

a combined water vapor permeability greater than about 300 grams per square meter per 24 hours at 40° C. and 80% relative humidity.

4,681,575

METHOD OF CHEMICAL DEODORIZATION OF ARTICLES AND SOLUTIONS USED IN MEDICAL AND BIOLOGICAL PROCEDURES

Lewis Knox, 6587 Hiawatha, Chicago, Ill. 60646

Filed Jan. 23, 1984, Ser. No. 573,014
Int. Cl.[4] A61F 13/16, 2/60, 2/66
U.S. Cl. 604—359 **10 Claims**

1. The method of deodorizing fluid and solid media and devices, instruments, appliance, articles and solutions used in connection with analytical, investigative, diagnostic and therapeutic, biological and medical procedures, said method being operative to elminate odors derived from urine and from fecal matter and residues discharged during the carrying out of medical procedures including procedures using endoscopes and other exploratory and surgical apparatus, and urological, proctoscopic, and colonoscopic procedures, said method eliminating the odors through reaction of a chemical deodorant with odor-producing groups and moieties of metabolically-produced odoriferous chemicals present in urine and fecal matter discharged during spills and "accidents" in sick rooms and during the conducting of medical procedures,

said method comprising the steps of preparing an aqueous composition containing 2, 4-pentanedione as a chemical

deodorant, and applying said composition to a substance to be deodorized.

4,681,576

WETNESS INDICATING HOT-METAL ADHESIVES

Herman Colon, Monsey, N.Y., and Albert Maletsky, Franklin Lakes, N.J., assignors to Malcolm Nicol & Co., Lyndhurst, N.J.

Filed Mar. 17, 1986, Ser. No. 839,943
Int. Cl.[4] A61F *13/16, 13/18, 13/20*; C08J *23/00*
U.S. Cl. 604—361 **14 Claims**

1. A wetness indicating hot-melt adhesive composition comprising:

(A) 20 to 70 wt.% of total polymer components, said polymer components comprising 35 to 100 wt.% of water sensitive polymer selected from vinyl pyrrolidone homopolymer, vinyl pyrrolidone/vinyl acetate copolymer or a mixture thereof, any balance comprising at least one polymer selected from the group consisting of ethylene/vinyl acetate copolymer, ethylene/acrylic acid copolymer and polyamide,

(B) 27 to 60 wt.% of organic acid selected from the group of

(a) at least one free monobasic saturated or unsaturated fatty acid having an acid number above 137, and wherein the proportion of said free monobasic saturated or unsaturated fatty acid to said total polymer components in the composition is such that the pH of the composition, when moist is within a range of 3 to 7;

(b) 15 to 50 wt.% of the fatty acid in combination with 10 to 55 wt.% of at least one other organic acid having an acid number above 130;

(C) 0 to 30 wt.% of a water soluble wax;

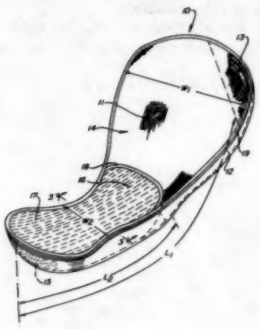
(D) a wetness indicating agent capable of causing the composition to change color in response to the presence of moisture in the composition and within said pH range of 3 to 7 in a relatively rapid time compared to that of broadly similar prior art, and in an amount effective to provide the composition with a readily visible color when wet which is distinct from the color of the dry composition.

4,681,577

DISPOSABLE URINARY AND FECAL WASTE CONTAINMENT PRODUCT

Beth A. Stern, Yardley, Pa., and Dennis C. Holtman, Flemington, N.J., assignors to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 535,192, Sep. 23, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,612
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—378 **19 Claims**



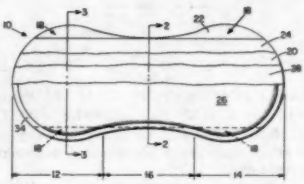
1. A disposable urinary and fecal waste containment product comprising a liquid-impermeable substantially flexible shell having a depth of at least about 0.25 inch; having a front urinary portion and a rear fecal portion; said front portion being narrower and having an area less than 70% of the area of said rear portion, said front urinary portion having a first superstructure placed in and substantially filling said front portion of said shell and an absorbent medium in contact with at least a portion of said superstructure; said superstructure being a corrugated fibrous web comprising hydrophobic wet resilient, dry resilient fibers, which is non-collapsible when wet and capable of maintaining a void volume when wetted; and said rear portion having a second superstructure placed in and substantially filling said rear portion of said shell said superstructure being non-collapsible when wet and capable of maintaining a void volume when wetted said second superstructure being comprised of a fibrous web, open cell foam, a fibrous pile structure, sliver knit, malivlieves, split corrugated web tufted yarn, dimensioned needle punch or mixtures thereof; said second superstructure being secured in said rear portion of said shell.

4,681,578

PANTILINER WITH VENTILATION AREAS

Arthur B. Anderson, and Sherry L. Brandt, both of Hamilton, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 8, 1985, Ser. No. 709,618
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **28 Claims**



1. An absorbent article having two end regions, a middle region, and at least one ventilation area positioned adjacent at least one of said end regions wherein body liquids are retained, said absorbent article comprising

a core having a garment-facing side and a body-facing side;

a relatively vapor pervious outer layer disposed adjacent said garment facing layer of said core and

a relatively impervious barrier layer interposed between said core and said outer layer, said barrier layer being substantially liquid, vapor and air impermeable;

wherein said barrier layer is substantially longitudinally coterminous with said absorbent; article and is of a relatively smaller transverse width than at least one of said end regions so as to form said ventilation area.

4,681,579

ABSORBENT ARTICLE HAVING RESERVOIRS

John W. Toussant, and Ted L. Blaney, both of West Chester, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Oct. 11, 1985, Ser. No. 786,900
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **5 Claims**

1. A disposable absorbent article having a front waist region, a crotch region and a back waist region, said absorbent article comprising:

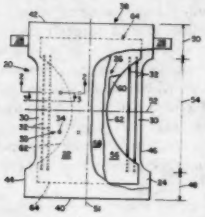
a liquid pervious topsheet;

a liquid impervious backsheet associated with said topsheet;

an absorbent core having side edges, said absorbent core disposed between said topsheet and said backsheet;

a flexible side flap extending outwardly from and along each side edge of said absorbent core in at least the crotch region;

an elastic member secured to each of said side flaps;
a securing means for securing portions of said side flaps to said topsheet; and
a reservoir formed by a portion of each of said side flaps arranged in a multiplicity of layers, a first layer being formed by an inwardly longitudinally extending fold in



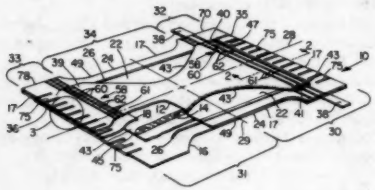
said side flap and a second layer formed by an outwardly longitudinally extending fold, a portion of said first layer being secured to said topsheet by said securing means, the remaining portions of said first fold being unsecured, and a portion of said second layer being secured to a portion of said first layer.

4,681,580

DISPOSABLE DIAPERS WITH UNITARY WAISTSHIELD AND ELASTICALLY EXPANSIBLE WAISTBANDS

George S. Reising, Batavia, and Jerry L. Dragoo, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 29, 1985, Ser. No. 717,749
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **6 Claims**



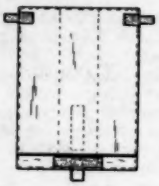
1. A disposable diaper having at least one elastically expansible waistband extending across at least a portion of at least one lateral edge of said diaper, said diaper comprising:
(a) A fluid permeable topsheet;
(b) A liquid impermeable backsheet;
(c) An absorbent core interposed between said topsheet and said backsheet; and
(d) At least one unitary waistshield and elastically expansible waistband member having an inward portion and an outward portion, said member extending along at least a portion of said at least one lateral edge of said diaper, said inward portion of said member interposed between said topsheet and said absorbent core, said outward portion of said member interposed between said topsheet and said backsheet and being affixed thereto,
wherein said at least one elastically expansible waistband comprises said outward portion of said unitary waistshield and elastically expansible waistband member.

4,681,581

ADJUSTABLE SIZE DIAPER AND FOLDING METHOD THEREFOR

Fredrica V. Coates, 1608 Dublin Rd., Charlottesville, Va. 22903

Filed Dec. 5, 1983, Ser. No. 558,273
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—391 **29 Claims**



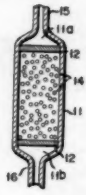
1. A baby or adult diaper that is adjustable in size, comprising:
an absorbent material having an inner surface adapted to contact the skin of the user when worn, and an outer surface;
attachment tabs formed of a first type of filamentary attachment material extending from opposite sides of said diaper material at one end of the diaper; and
an elongated bar of a complementary type of filamentary attachment material located centrally between said sides on the inner surface of said diaper material adjacent and parallel to an opposite end of the diaper, said bar having a length from about one half to about three fourths the full width of the diaper material;
a portion of the diaper material carrying the bar being adapted to be front folded onto the outer surface of the diaper material and positioned longitudinally on the diaper material to establish a proper diaper length for the user,
a central, longitudinally extending first fastener means on the outer surface of the diaper material,
a second fastener means on the outer surface of the diaper material opposite the bar and adapted to be coupled to said longitudinal fastener means,
said attachment tabs being adapted to be coupled to said bar to secure the diaper to the user.

4,681,582

DRUG ADMINISTERING APPARATUS

Yuichi Yamamoto, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,412
Claims priority, application Japan, Jun. 13, 1984, 59-121463/1
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—890 **17 Claims**



1. A drug administering apparatus comprising:
a container with body fluid inlet and outlet ports which communicate with each other;
a liposome agent entrapping a drug therein; and

an insoluble substance fixed inside said container and having said liposome agent such that said liposome agent can be brought into contact with the body fluid flowing in said container;

said insoluble substance comprising a polymeric substance having a hydrophilic group and having been crosslinked to have a three-dimensional network structure;

said liposome agent being held between lattices of said network structure;

whereby said drug entrapped in said liposome agent is released into the body fluid flowing in said container.

4,681,583

SYSTEM FOR DISPERSING DRUG IN BIOLOGICAL ENVIRONMENT

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 451,329, Dec. 20, 1982, Pat. No. 4,578,075. This application Feb. 24, 1986, Ser. No. 832,192

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] A61J 3/00

U.S. Cl. 604—892 **7 Claims**

1. A delivery system for delivering a beneficial agent, the delivery system comprising:

(a) a wall that surrounds and forms an internal space, the wall comprising at least in part a pH sensitive composition comprising means for changing its physical and chemical integrity in an environment having a pH of 1.0 to 3.5 inclusive for releasing dosage forms in the internal space into an environment of use;

(b) a plurality of individual dosage forms in the internal space, the dosage forms comprising at least one of a size selected from 0.5 mm to 10 mm, the dosage forms comprising:

(1) a wall that surrounds and forms an internal compartment, the wall comprising a composition that is permeable to the passage of an external fluid and impermeable to the passage of a beneficial agent;

(2) a beneficial agent in the compartment; and,

(3) at least one passageway in the wall of the dosage form, said passageway formed when the dosage form is in use by at least one of (a) eroding a passageway forming composition from the wall, (b) leaching a passageway forming composition from the wall, and (c) by bursting a passageway in the wall for delivering the beneficial agent through said passageway from the dosage form.

4,681,584

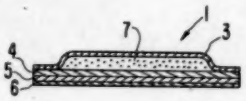
TRANSDERMAL DELIVERY SYSTEM FOR DELIVERING NITROGLYCERIN AT HIGH TRANSDERMAL FLUXES

Robert M. Gale, Los Altos, and Randall G. Berggren, Livermore, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 730,714, May 3, 1985, Pat. No. 4,615,699. This application Jun. 2, 1986, Ser. No. 869,548

Int. Cl.[4] A61K 9/00

U.S. Cl. 604—897 **7 Claims**



1. A method of treating angina pectoris or congestive heart failure which comprises transdermally administering nitroglycerine to a patient suffering from the condition, said nitroglycerine being administered at a rate of at least about 40 mcg/cm^{2}hr for an extended period of time.

4,681,585

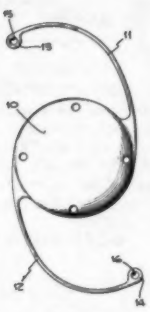
INTRAOCULAR IMPLANT

Reizo Sayano, Montebello, Calif., and Eugene P. Goldberg, Tampa, Fla., assignors to Intermedics Intraocular, Inc., Pasadena, Calif.

Continuation of Ser. No. 598,861, Apr. 11, 1984, abandoned. This application Mar. 13, 1986, Ser. No. 839,084

Int. Cl.[4] A61F 1/16

U.S. Cl. 623—6 **13 Claims**



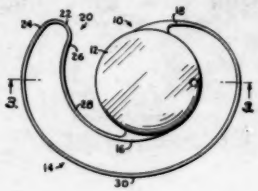
1. An intraocular implant consisting essentially of an optic lens and haptic for fixation of said lens in the posterior or anterior chamber of the eye, said implant having thermal stability sufficient to render said implant autoclave sterilizable, said implant being chemically stable when sterilized with high energy radiation, said optical lens consisting essentially of a solid thermoplastic polymer which is substantially transparent to visible light, is biocompatible, has a glass transition temperature of at least 120° C. and is thermally stable at a temperature of at least 120° C., and has a notched Izod impact strength at about one-eighth inch thickness of about at least one foot pound per inch, said thermoplastic polymer having repeating units of aromatic groups linked together by one or more linkages selected from the group consisting of ether, ester, sulphone, carbonyl and imide.

4,681,586

INTRAOCULAR LENS HAVING UNITARY INTEGRAL HAPTIC MEANS

Randall L. Woods, 1704 Nicklaus, Clinton, Mo. 64735

Filed Aug. 22, 1986, Ser. No. 899,309
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **6 Claims**



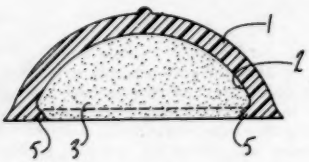
1. An implantable intraocular lens, comprising:
an optic presenting a peripheral edge;
a single, unitary, resilient eye fixation haptic having a pair of ends; and
means mounting said haptic to said optic for defining an elongated, continious, arcuate, outwardly extending fixation stretch intermediate said ends, and first and second locations adjacent said optic periphery and in generally opposed relationship to one another where said haptic begins to diverge outwardly from the peripheral edge and assume a radius substantially greater than the radius of said optic,
said fixation stretch presenting a terminal, smoothly U-shaped bight, and first and second, spaced apart, arcuate legs respectively leading from said bight to a corresponding location, said first leg being substantially longer than said second leg, said legs being substantially parallel to one another throughout a majority of the length of said second leg,
said first leg extending around at least 180° and less than 360° of the periphery of said optic from said first location,
said fixation stretch terminating short of a full 360° extension around said optic periphery.

4,681,587

MASTOPROSTHESIS

Tertulin Eberl, Penzberg, Fed. Rep. of Germany, and Georg Weber-Unger, Kufstein, Austria, assignors to Anita-Spezialmiederfabrik Dr. Helbig & Co., Kufstein, Austria

Continuation of Ser. No. 600,483, Apr. 16, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,702
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 8311438[U]
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—7 **10 Claims**



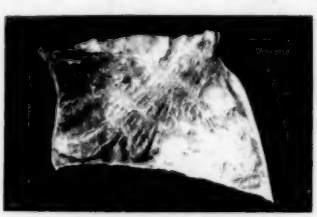
6. A mastoprosthesis for wearing within a brassiere by a person having mastectomy scar tissue located rearwardly of said brassiere, said mastoprosthesis comprising,
a body consisting of an inner solid core of a soft synthetic material resembling in its consistency and specific weight the natural breast tissue and an outer film covering said core completely, said body having a front surface which is contoured to conform to the shape of a female breast and a rear surface defining a cavity which is contoured to conform substantially to the contour of said front surface, said cavity having a rearwardly presented opening;
a single one piece pad member inserted into said cavity, said pad member being lighter in specific weight than said body, and having a front surface and a rear surface, said front surface of said pad member facing and substantially conforming to said rear surface of said body;
said rearwardly presented opening of said cavity being sufficiently large to permit said pad member to be inserted into and removed from said cavity;
said solid core being formed of silicon and said outer film being of polyurethane,
said body and pad member being releasably attached to one another;
said rearwardly presented opening of said cavity being substantially free of said silicone of said body so as to minimize interference of said silicone of said body with said scar tissue and so as to expose substantially said entire rear surface of said pad member rearwardly toward said scar tissue of said person through said rearwardly facing opening of said cavity.

4,681,588

BIOMATERIAL

Vettivetpillai Ketharanathan, 35 Degraves Street, Parkville, Victoria, Australia

PCT No. PCT/AU84/00206, § 371 Date Jun. 17, 1985, § 102(e) Date Jun. 17, 1985, PCT Pub. No. WO85/01651, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 17, 1984, Ser. No. 760,745
Claims priority, application Australia, Oct. 20, 1983, PG1955
Int. Cl.[4] A61F *2/02, 2/06;* A61B *19/00;* A61L *17/00*
U.S. Cl. 623—11 **12 Claims**



1. A biomaterial comprising a sheet of animal parietal pleura which has been subjected to glutaraldehyde tanning.

4,681,589

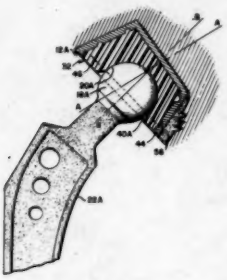
ADJUSTABLE ACETABULAR CUP PROSTHESIS AS PART OF A TOTAL CUP REPLACEMENT SYSTEM

Raymond G. Tronzo, 255 Clarke Ave., Palm Beach, Fla. 33480

Filed Jun. 1, 1984, Ser. No. 616,100
Int. Cl.[4] A61F *2/34*
U.S. Cl. 623—22 **5 Claims**

1. An acetabular cup for use with a femoral ball in a total hip joint prosthesis comprising:
a hollow shell having a shape of truncated cone, said cone tapering from an open face front and to a closed rear face and said shell having a central longitudinal cone axis therethrough wherein said rear face is substantially perpendicular to said cone axis and said front face subtends an acute angle with respect to the rear face; and thereby providing constant dynamic bony contact which prevents loosening of said shell in the joint; and
a bearing member having an outer surface complimentary to inner surface of said shell so as to be engageable therewith when inserted through said open face; said bearing mem-

ber having a socket formed therein for receiving said femoral ball, said socket defined by an axis therethrough being angularly displaced from said cone axis wherein the socket is disposed eccentrically with respect to the cone



axis whereby, when the cup is rotated about its longitudinal axis, the bearing member is moved through an angular arc to permit said bearing member to be placed in an optimum position for receiving said femoral ball.

4,681,590

FEMORAL STEM PROSTHESIS

John Tansey, 6019 Foxhall Farm Rd., Baltimore, Md. 21228

Filed Jun. 18, 1986, Ser. No. 875,628

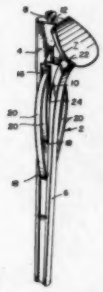
Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 **14 Claims**

1. A femoral stem prosthesis comprising:

(a) an elongated stem portion adapted to be inserted into the intramedullary canal of the femur and firmly attached to surrounding walls thereof;

(b) anchoring means associated with the stem, said anchoring means comprising at least one elongated resilient member which has a first end in operative engagement with the actuating means, and a second end attached to the stem;



(c) actuating means for causing outward bowing of the anchoring means into firm engagement with the surrounding walls of the canal, said actuating means comprising an actuator screw thereadably mounted within a bore formed in the stem, a plunger slidably received within the bore with one end of the plunger in axial engagement with the actuator screw, and the other end of the plunger provided with a retaining collar adapted to receive the said first end of said at least one elongated resilient member.

4,681,591

PROCESS FOR PRODUCING AN ELECTROMAGNETIC RADIATION-SHIELDING, METALLIZED POLYESTER FIBER TEXTILE MATERIAL

Shinpei Okayasu, Ishikawa; Shinichi Uchikoshi, Kaga, and Atsuo Nobatake, Kanazawa, all of Japan, assignors to Takase Dyeing & Printing Works, Ltd., Osaka, Japan

Continuation of Ser. No. 686,252, Dec. 26, 1984, abandoned.
This application May 22, 1986, Ser. No. 868,163
Claims priority, application Japan, Aug. 20, 1984, 59-171420
Int. Cl.[4] D06M *5/02, 11/00*
U.S. Cl. 8—115.68 4 Claims

1. A process for metallizing a textile material having a high surface or sheet resistivity of 10^{-2} to 10 ohms and containing polyester fibers to produce a material to shield electronic devices from electromagnetic radiation interference, comprising the steps of:

pre-treating a textile material containing at least 15% by weight of polyester fibers with an aqueous solution of a caustic alkali to an extent that the weight of the polyester fibers is decreased by at least 10% based on the original weight of the polyester fibers for activating the surface of the polyester fibers to increase the amount of a metal coating which can be plated onto the polyester fibers for enhancing the bonding strength of the polyester fiber surfaces to the metal coating;

activation-treating the pre-treated textile material with a tin (II)-containing compound and with a palladium-containing compound;

non-electrolytically plating the activation-treated textile material in a plating liquid containing a compound of an electroconductive metal to be plated, an alkali and/or ammonia, and hydrazine as a reducing agent to form a plated metal coating thereon, said hydrazine being used as a reducing agent in the non-electrolytical plating liquid, the resultant metal coating having a high purity and an enhanced crystallinity of the metal crystals such that the resultant metalized textile material exhibits an enhanced electroconductivity; and

said electroconductive metal being selected from the group consisting of nickel, cobalt, chromium, and alloys of at least two of the above-mentioned metals, said pretreating step being effective for activating the surface of the polyester fibers for promoting the formation of the plated metal coating.

4,681,592

PERACID AND BLEACH ACTIVATOR COMPOUNDS AND USE THEREOF IN CLEANING COMPOSITIONS

Frederick E. Hardy, Newcastle upon Tyne, and Barry T. Ingram, Whitley Bay, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1985, Ser. No. 747,468
Claims priority, application United Kingdom, Jun. 21, 1984, 8415909
Int. Cl.[4] D06L *3/06;* C07C *69/00*
U.S. Cl. 8—111 22 Claims

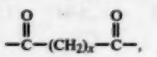
1. Peracids of the formula:

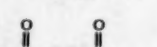
$$[RX]_mAOOH$$

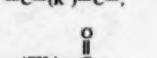
wherein

R is hydrocarbyl, selected from the group consisting of optionally substituted, linear and branched C_6–C_{20} alkyl and alkenyl and C_6–C_{20} alkyl-substituted aryl; or alkoxylated hydrocarbyl;

X is selected from the group consisting of O, SO_2, $N(R')_2$, $P(R')_2$, $(R')P{\rightarrow}O$ and $(R')N{\rightarrow}O$; m is either 1 or 2; and wherein for m=1, A is selected from the group consisting of







and

where x is an integer from 0 to 4; z is an integer from 0 to 2; (R′) is alkyl and R″ is branched-chained alkylene and wherein for m=2, A is

12. A method of cleaning fabrics or surfaces comprising contacting said fabrics or surfaces with a peracid according to claim 1.

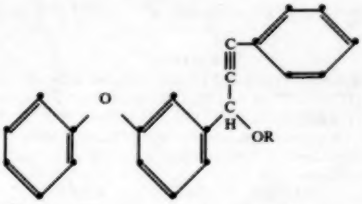
4,681,593

PROCESS AND COMPOSITIONS FOR PROTECTING KERATINOUS MATERIAL FROM ATTACK BY PESTS THAT FEED ON KERATIN, AND NOVEL ESTERS

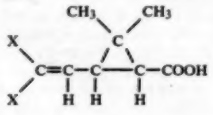
Saleem Farooq, Arisdorf, Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Werner Schmid, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1986, Ser. No. 816,462
Claims priority, application Switzerland, Jan. 14, 1985, 150/85
Int. Cl.[4] D06M *3/02;* C07C *69/74*
U.S. Cl. 8—128 R 8 Claims

1. A process for providing keratinous material with a protective finish against attack by insects that feed on keratin, which process comprises treating the material to be protected with an ester of the formula

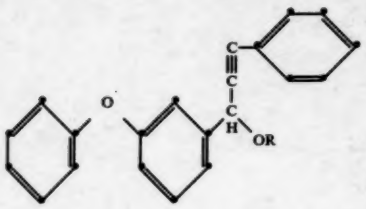


wherein R is the radical of an acid of the formula

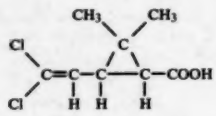


in which X is a C_1–C_4alkyl group or halogen or one of the two substituents X is a phenyl group, or R is the radical of 4-chlorophenylisopropylacetic acid.

4. An ester of the formula



wherein R is the radical of an acid of the formula



or of 4-chlorophenylisopropylacetic acid.

4,681,594

PROCESS FOR DISPERSE DYEING DRY-SPUN ATACTIC POLYVINYL CHLORIDE-BASED FILAMENTS AND FIBRES BEFORE DRAWING

Pierre Chion, Bar-Le-Duc, and Jacques Menault, Charbonnieres-les-Bains, both of France, assignors to Rhovyl, Neuilly-sur-Seine, France

Filed Mar. 11, 1986, Ser. No. 838,352

Claims priority, application France, Mar. 26, 1985, 85 04619

Int. Cl.[4] D06B *3/04;* D06P *1/16*

U.S. Cl. 8—489 **5 Claims**

1. In a process for continuously dyeing filaments based on atactic polyvinyl chloride, which are obtained by dry spinning, drawn in at least one step, oiled and shrunk, the improvement comprising impregnating the undrawn filaments in an impregnating bath containing a dyestuff maintained at a temperature of between 60° and 90° C. and containing at least one piastosoluble dye, while the filaments have a density of between 1.3 and 1.4 g/cm^3, fixing continuously in the presence of steam, under pressure at a temperature of between 100° and 120° C. for 2 to 20 seconds, and thereafter maintaining the filaments under tension between 0.065 g/dtex and 0.0150 g/dtex while they are fixed in the presence of steam, under pressure, at a temperature of between 100° and 130° C. for 1 to 20 seconds.

4,681,595

PROCESS FOR DISPERSE DYEING DRY-SPUN ATACTIC POLYVINYL CHLORIDE-BASED FILAMENTS AND FIBRES AFTER DRAWING THE WET TOW

Pierre Chion, Bar-le-Duc, and Jacques Menault, Charbonnieres-les-Bains, both of France, assignors to Rhovyl, Neuilly-sur-Seine, France

Filed Mar. 25, 1986, Ser. No. 843,603

Claims priority, application France, Mar. 26, 1985, 85 04618

Int. Cl.[4] D06B *3/04;* D06P *1/16;* D01F *6/10*

U.S. Cl. 8—489 **2 Claims**

1. In a process for continuously dyeing filaments based on atactic polyvinyl chloride, which filaments are obtained by dry spinning, then drawing in at least one phase, oiled, and shrunk in an aqueous medium, the improvement comprising impregnating the filaments, after drawing, with a dyestuff maintained at a temperature of between 60° and 90° C. and containing at least one plastosoluble dye, the filaments having, at the time of the impregnation, a density of between 1.3 and 1.4 g/cm^3, with the filaments formed into a tow then containing from about 10 to about 30% by weight of water, the filaments being subjected to a stress of 0.05 to 0.35 g/tex of the time of the impregnation, and thereafter stabilizing the filaments under tension, in the presence of stream, under pressure, at a temperature of between 100° and 130° C. for 2 to 20 seconds.

4,681,596

PROCESS FOR DYEING NATURAL OR SYNTHETIC POLYAMIDE FIBRE MATERIALS WITH 1:1 METAL COMPLEX DYES OR MIXTURES OF DYES WITH FLUORIDE, FLUOROSILICATE OR FLUOROBORATE

Gerhard Back, Lörrach, Fed. Rep. of Germany, and Walter Mosimann, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 737,112, May 23, 1985, Pat. No. 4,623,358. This application May 9, 1986, Ser. No. 861,378

Claims priority, application Switzerland, May 30, 1984, 2667/84; May 24, 1985, 2219/85

Int. Cl.[4] C09B *45/02, 67/24;* D06P *1/67, 3/06*

U.S. Cl. 8—620 **25 Claims**

1. A process for dyeing natural or synthetic polyamide fibre material from an aqueous liquor with mixtures of dyes, in the presence of an alkali metal salt or an ammonium salt and optionally in the presence of an assistant, which process comprises dyeing said fibre material with a mixture containing at least one 1:1 metal complex dye which contains sulfo groups and at least one metal-free dye which contains sulfo groups, in the presence of an alkali metal or ammonium fluoride, an alkali metal or ammonium fluorosilicate, an alkali metal or ammonium fluoroborate, an alkali metal or ammonium fluorozirconate or an alkali metal or ammonium fluorosulfonate, at a pH value in the range from 3 to 7.

4,681,597

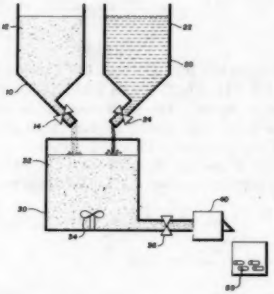
METHOD FOR AGGLOMERATING POWDERED COAL BY COMPACTION

Larry D. Byrne, and Barbara J. Byrne, both of R.R. 1, Belle Fourche, S. Dak. 57717

Filed Jun. 15, 1981, Ser. No. 273,603

Int. Cl.[4] C10L *5/10*

U.S. Cl. 44—15 R **10 Claims**



1. A method for preparing a powdered carboniferous composition and forming this composition into solid product shapes suitable for handling, transporting and burning, comprising the steps of:

(a) mixing (1) powdered carboniferous material with (2) an amount of surfactant effective for wetting the powdered carboniferous material with water but for which no appreciable binding occurs between the surfactant and carboniferous material upon compaction and (3) an amount of water effective to bring the moisture content of the resul-

tant mixture within the range of about 32 to 35% by weight;

(b) working the mixture to obtain a homogeneous composition comprising a uniform dispersion of the water, surfactant, and powdered carboniferous material; and

(c) compacting the resultant homogeneous composition into the desired solid product shape by extruding the homogeneous composition through a ring pelletizing extruder.

4,681,598

METHOD OF REMOVING PYRITIC SULFUR FROM COAL

Thomas M. Godbold, and William R. Baker, both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Dec. 16, 1985, Ser. No. 809,922

Int. Cl.[4] C10L *9/08*

U.S. Cl. 44—1 SR **9 Claims**

1. The method of removing sulfur from coal, comprising:

(a) subjecting subdivided pyritic sulfur-containing coal to heat decomposition with evolution of gas containing sulfur compounds;

(b) progressively increasing the temperature of said decomposition from a temperature range below 375° C. to a temperature range above 550° C.;

(c) separately collecting gas evolved within the temperature range from 375° to 550° C. which separately collected gas contains at least 60% by weight of the total decomposable pyritic sulfur in not over 40% by volume of the total evovable gas; and

(d) continuing said heating at temperatures above 550° C. without combining the thus-evolved gas with said separately collected gas.

4,681,599

GASSIFICATION OF CARBON CONTAINING WASTE, REFUSE OR THE LIKE

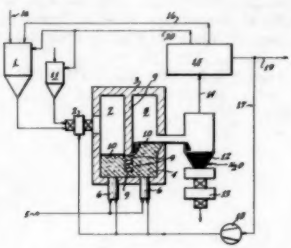
Bernt Obkircher, Aufham, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,214

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1985, 3434004

Int. Cl.[4] C10J *3/48, 3/78*

U.S. Cl. 48—92 **15 Claims**



1. An apparatus for the gassification of carbon containing refuse, or waste or the like, comprising:

reactor means including a top and bottom, and a first reaction chamber, and a second reaction chamber located next to each other, there being a vertical partition means between said reaction chambers extending from the reactor top down to the reactor bottom, said partition having in its lower part a plurality of relatively small openings which increase in total cross-sectional area in a downward direction the chambers containing a liquid bath having a temperature in excess of 1000 degrees centigrade;

means for introducing waste etc, into the upper portion of the first chamber for dropping into the liquid bath;

means for introducing from a lower level of at least one of said chambers an oxidizing medium, the liquid bath level in the second chamber is and remains above said openings, said reactor constructed so that developed pressure in the first chamber forces liquid in the first chamber into a lower level than the level in said second chamber so as to obtain a liquid level difference in the two chambers; and

means for extracting slag and gas from the second chamber.

4,681,600

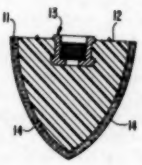
CUTTING TOOL FABRICATION PROCESS

Lawrence J. Rhoades; William D. Jenkins, both of Pittsburgh, and David D. Pertle, Irwin, all of Pa., assignors to Extrude Hone Corporation, Irwin, Pa.

Continuation of Ser. No. 647,532, Sep. 5, 1984. This application Sep. 16, 1985, Ser. No. 776,652

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **13 Claims**



1. A method of making an abrasive tool having working surfaces comprising the steps of sequentially;

A. forming a negative image of the tool in a mold,

B. placing a coating composition in the mold at regions that will become the working surfaces of the final tool,

C. introducing into the mold a particulate abrasive and a first substrate which is flowable and setable, the abrasive and first substrate being provided,

i. in proportional amounts wherein the first substrate at least partially impregnates the interstices of the particulate abrasive, and

ii. in total amounts wherein the mixture of the first substrate and the particulate abrasive incompletely fills the mold,

D. applying sufficient centrifugal force and/or vibratory action to the mold to cause,

i. the first substrate to at least partially impregnate said interstices, and conform the first substrate-abrasive mixture to the shape of the mold, thus forming a first substrateabrasive shell, and

ii. the abrasive to migrate through the first substrate into the coating composition, thus causing abrasive particles to be partially within said first substrate and partially within said coating composition,

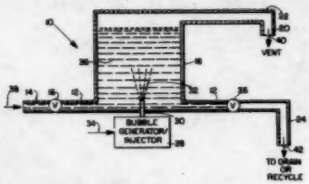
E. at least partially filling the mold with a second substrate whereby forming in situ a support for said shell in non-working regions of the final abrasive tool, whereby each abrasive grain is partially bound on a working surface of the tool by the binding composition and partially by the first substrate.

4,681,601

BUBBLE INJECTION DISSOLVED GAS MEASUREMENT METHOD AND APPARATUS

Donald A. Foster, Lakeville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,230
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—18 12 Claims



1. Apparatus for rapidly and accurately measuring the percentage of dissolved gas in a liquid, said apparatus comprising:

means for sampling a portion of said liquid;

means for generating a multiplicity of gas bubbles of equal diameter and of the same type as the dissolved gas and for introducing said bubbles into said liquid sample; and

means for determining the length of time gas bubbles survive within said liquid sample from the time of initial introduction of a bubble until it is absorbed by said liquid sample to thereby determine the percentage of dissolved gas in said liquid.

8. Apparatus for measuring the percentage of dissolved gas in a liquid, said apparatus comprising:

a conduit having an inlet and an outlet;

means for directing a sample of said liquid through said conduit at a constant flow rate;

means for injecting a stream of gas bubbles of given size and of the same type of gas as the dissolved gas into said sample at a given point along said conduit; and

means downstream of said point of injection for determining the termination point of said stream of bubbles along said conduit and for providing a measure of the length between said injection point and termination point whereby in accordance with said constant flow rate the survival time of said bubbles and consequently the percentage of dissolved gas can be determined.

4,681,602

INTEGRATED SYSTEM FOR GENERATING INERT GAS AND BREATHING GAS ON AIRCRAFT

Gary S. Glenn, Seattle; Vinod K. Rajpaul, Bellevue, and Roger F. Yurczyk, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 24, 1984, Ser. No. 685,397
Int. Cl.[4] B01D *53/04, 53/22*
U.S. Cl. 55—21 8 Claims

1. In an aircraft, a method of generating oxygen enriched gas and combustibly inert gas from bleed air, comprising:

providing first and second gas separation modules;

supplying bleed air having an oxygen component and a nitrogen component to the first module;

in the first module, separating said bleed air into a first product gas enriched in one of said components, and a first waste gas enriched in the other of said components;

transporting the first waste gas from the first module to the second module;

boosting the pressure of the first waste gas, after it exits the first module and before it enters the second module, to a working level required by the second module; and allowing the first waste gas to exit the first module at a relatively low pressure; and

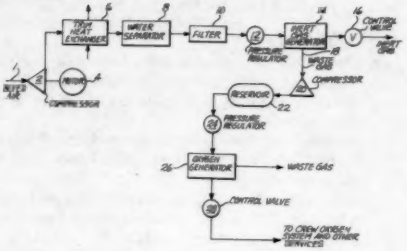
in the second module, separating the first waste gas into a second product gas further enriched in said other of said components, and a second waste gas.

5. In an aircraft, a system of generating oxygen enriched gas and combustibly inert gas from bleed air, comprising:

supply means for supplying bleed air having an oxygen component and a nitrogen component to the system;

a first gas separation module for receiving the bleed air supplied by the supply means and separating said bleed air into a first product gas enriched in one of said components, and a first waste gas enriched in the other of said components; said module having an outlet;

conduit means for transporting the first waste gas out of the first module through said outlet;



a second gas separation module for receiving the first waste gas from the conduit means and separating said waste gas into a second product gas further enriched in said other of said components, and a second waste gas; said second module having an inlet through which it receives the first waste gas; and

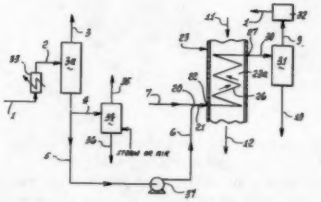
pressure control means for creating a pressure differential between the outlet of the first module and the inlet of the second module, to boost the pressure at said inlet to a working level required by the second module while allowing the pressure at said outlet to remain at a relatively low level.

4,681,603

FEED GAS SATURATION SYSTEM FOR STEAM REFORMING PLANTS

Harvey D. Spangler, Fort Dodge, Iowa, and Kenneth V. Lamb, Monrovia, Calif., assignors to Kinetics Technology International Corporation, Monrovia, Calif. and Farmland Industries, Corporation, Kansas City, Mo.

Filed Feb. 13, 1986, Ser. No. 829,020
Int. Cl.[4] B01D *47/06*
U.S. Cl. 55—27 16 Claims



1. The method of recovering low level heat from a low or medium temperature first fluid stream, in conjuntion with operation of a process employing input hydrocarbon feed gas and providing process effluent separable into process condensate and dry gas, the steps that include: maximizing heat recovery from low level heat sources in systems having only one

temperature difference, by saturating hydrocarbon feedstock with process condensate, by

(a) mixing said condensate with said input feed gas and flowing the resultant two-phase mixture through a heat exchanger,

(b) flowing said low or medium temperature fluid stream through said heat exchanger and transferring heat from said steam through a wall to said mixture, thereby to vaporize process condensate and to saturate the hydrocarbon feed gas in the mixture, said low or medium temperature fluid stream consisting of a flue gas at a temperature or temperatures between 350° and 800° F.,

(c) and subsequently separating the saturated hydrocarbon feed gas from excess liquid condensate, whereby the separated saturated feed gas may be employed in the process, and the excess condensate may be recycled for mixing with said input feed gas,

(d) and including said step of separating said process effluent, which consists of synthesis gas from a steam reforming plant, into dry synthesis gas and aqueous condensate, and boosting the pressure of said condensate for said mixing with input feed gas,

(e) said (a) step mixing being carried out by providing multiple nozzles, and injecting said condensate through said nozzles to pass into multiple streams of said input feed gas.

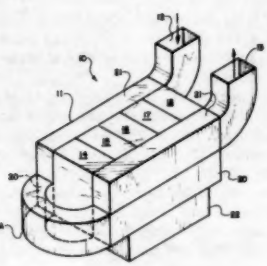
11. The invention of one of claims **1** or **10** wherein said process condensate comprises boiler feedwater.

4,681,604

MULTISTAGE FLUID FILTER AND METHOD

Kurt W. Niederer, 3021 Mountainbrook Rd., Charlotte, N.C. 28210

Filed Apr. 29, 1986, Ser. No. 856,964
Int. Cl.⁴ B01D *47/00, 50/00*
U.S. Cl. 55—96 **16 Claims**



1. A multistage fluid filter for filtering entrained particulate matter from a moving fluid stream at substantially constant fluid pressure and filtration efficiency during continuous on-line operation, said filter comprising:

(a) a housing having a fluid inlet and a fluid outlet;

(b) first, second and third stationary filtration chambers positioned in said housing, each having a filtration medium therein from an upstream side to a downstream side thereof;

(c) first conduit means for selectably interconnecting any two chambers of said first, second and third filtration chambers in series for fluid flow from the downstream side of one of the two chambers defined as a first filter stage for accumulating particulate matter on the filtration medium thereof to the upstream side of the other of the two chambers defined as a second filter stage having a previously accumulated layer of particulate matter on the filtration medium thereof;

(d) second conduit means for selectably interconnecting the fluid inlet in the housing with the upstream side of the filtration chamber defined as the first filter stage, the fluid outlet in the housing with the downstream side of the filtration chamber defined as the second filter stage and for interrupting fluid flow into and out of the third one of said first, second and third filtration chambers to define a cleaning stage therein;

(e) cleaning means for cleaning particulate matter from the filter medium in the cleaning stage while fluid flow herewith is interrupted; and

(f) sequencing means for selectably operating said first and second conduit means to, after cleaning particulate matter from the filter medium in the cleaning stage and, upon an increase in resistance to fluid flow through said second filter stage caused by an increase in thickness and/or density in the layer of particulate matter, redefine the cleaning stage as the first filter stage, said first filter stage as said second filter stage and said second filter stage as said cleaning stage, successively to permit the filter to operate continuously after a filter layer is accumulated on the filter medium in any of the first, second or third filtration chambers.

15. A method for filtering entrained particulate matter from a moving fluid stream at substantially constant fluid pressure and filtration efficiency during continuous on-line operation, said method comprising the steps of:

(a) providing a housing having a fluid inlet and a fluid outlet, first, second and third filtration chambers positioned in said housing, a filtration medium positioned in each filtration chamber from an upstream side to a downstream side thereof, first conduit means for selectably interconnecting any two chambers of the first, second and third filtration chambers in series for fluid flow from the downstream side of one of the two chambers defined as a first filter stage to the upstream side of the other of the two chambers defined as a second filter stage, second conduit means for selectably interconnecting the fluid inlet in the housing with the upstream side of the filtration chamber defined as the first filter stage, the fluid outlet of the housing with the downstream side of the filtration chamber defined as the second filter stage, and for interrupting fluid flow into and out of the third one of said first, second and third filtration chambers to define a second stage therein and cleaning means for cleaning particulate matter from the filter medium in the cleaning stage while fluid flow therewith is interrupted;

(b) accumulating particulate matter on the clean filter medium in the first filter stage;

(c) redefining the cleaning stage as the first filter stage, the first filter stage as the second stage and said second filter stage as said cleaning stage, successively, upon an increase in resistance to fluid flow through said second filter stage caused by an increase in thickness and/or density in the layer of the particulate matter;

(d) interrupting fluid flow to the cleaning stage; and

(e) cleaning particulate matter from the filter medium in the cleaning stage while the fluid flow therewith is interrupted.

4,681,605

ANISOTROPIC MEMBRANES FOR GAS SEPARATION

Arye Z. Gollan, Newton, Mass., assignor to A/G Technology Corporation, Needham, Mass.

Filed Jun. 27, 1985, Ser. No. 749,574
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—158 **27 Claims**

1. A method of making anisotropic membranes for gas separation which method includes the steps of,

forming a casting solution having a base polymer of ethyl cellulose with at least substantially 2.2 ethoxyl groups per anhydroglucose unit and a nonsolvent compatible with said base polymer in a solvent system including at least one solvent having relatively high volatility with a low boiling point below 100° C.,

casting a membrane precursor with said casting solution,

exposing said cast membrane precursor to air for a short time

interval significantly less than a minute to cause sufficient solvent loss to form an integral skin layer,

and then immersing the cast membrane precursor into a leaching agent that dissolves said nonsolvent but not said

base polymer sufficiently long to dissolve said nonsolvent and form an anisotropic membrane with pores and an integral, essentially imperfection-free separating skin layer comprising said ethyl cellulose,

and then drying said membrane.

4,681,606

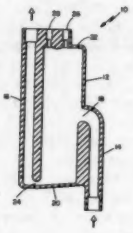
DRIP CHAMBER

Jack C. Swan, Jr., Boulder, Colo., and Paolo Poggioli, Mirandola, Italy, assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Feb. 26, 1986, Ser. No. 833,892

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—193 **6 Claims**



1. An in-line flow-through chamber for conveying blood comprising

an elongated container having sides, a top and a bottom for mounting with its longitudinal axis in a vertical orientation,

an inflow tube formed integrally with said container, extending upward vertically along a side of said container and entering said container through a chamber inlet at a flow direction transverse to said longitudinal axis and at a location spaced from the bottom of said chamber, and

An outflow tube formed integrally with said chamber, extending vertically along a side of said container so that tubes attached to said inflow tube and said outflow tube are in line with each other, said outflow tube having its entrance at the bottom of said container and extending upward,

said container providing a storage volume with uninhibited flow from said inflow tube to said outflow tube,

said container including a port at the top of said container for communication with a pressure monitor, whereby said port is at a position spaced from the direction of flow of blood into said container to avoid directing spurts of blood to said port.

4,681,607

DUST REMOVAL

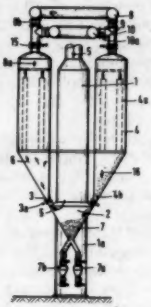
Rolf Bollerhey, Kempen, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,505

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422093

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—284 **6 Claims**



1. Dedusting equipment using a dust pre-precipitator and a plurality of filters with dry filter elements and being arranged around the pre-precipitator comprising:

said pre-precipitator having a top inlet for receiving raw gas and being disposed, arranged and constructed for having said cleaning raw gas flowing down and emerging from the predust precipitator at a bottom thereof, there being a dust hopper provided at the bottom of the dust pre-precipitator for collecting dust particles having been, removed from the raw gas in the dust pre-precipitator;

the filters of the plurality are arranged around the dust pre-precipitator each having an inlet at the bottom and an outlet at the respective top;

means for connecting the dust pre-precipitator to the filters of the plurality at respective inlets thereof, so as to obtain a reversal of gas flow as it flows out of the bottom of the pre-precipitator through the dust hopper and into the filters through the respective inlets thereof;

means connected to the filter tops for extracting clean gas from the top of said filters; and

means for selectively charging cleaning gas into individual ones of said filters and also from the tops thereof.

4,681,608

SILENCING FILTER

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 647,427, Sep. 5, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 849,041

Claims priority, application Japan, Sep. 9, 1983, 58-139809

Int. Cl.[4] B01D *27/08*

U.S. Cl. 55—276 **7 Claims**

1. A power driven machine comprising a machine frame including an exterior wall and a pair of upwardly extending filter support walls (3,4) defining therebetween a pair of air inlet chambers (8,9) and a central clean-air chamber (11) leading to an internal combustion engine;

a generally horizontal filter element extending across said machine and supported by said upwardly extending filter support walls, said filter element defining an upper air chamber (10) overlying the central clean-air and air inlet chambers, and said filter element including a porous air-filtering section between the upper air chamber and the clean-air chamber;

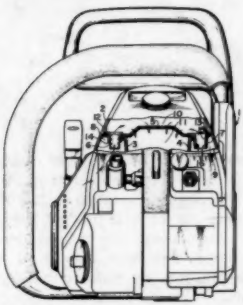
and an insertable and replaceable elongated silencing pipe

(6) providing an air passageway between the air inlet chambers and the upper air chamber, said silencing pipe having an upper end terminating at approximately the level of said filter element so that said silencing pipe does not extend substantially into the upper air chamber;

whereby air flowing in through an air inlet port is caused to flow upwardly through the air inlet chambers and upwardly through the silencing pipes into the upper air chamber and then downwardly through the porous air-filtering section of said filter element into the central clean-air chamber to the internal combustion engine.

7. A power driven machine comprising a machine frame including an exterior wall and a pair of upwardly extending filter support walls defining therebetween a pair of air inlet chambers and a central clean-air chamber leading to an internal combustion engine;

a generally horizontal filter element extending across said machine and supported by said upwardly extending filter support walls said filter element defining an upper air



chamber overlying the central clean-air chamber and air inlet chambers and said filter element including a porous air-filtering section between the upper air chamber and the clean-air chamber and also including extending portions between the upper air chamber and the inlet chambers; and

elongated silencing pipes integral with said extended portions of said filter element, said elongated silencing pipes each having an upper end terminating at approximately the level of said filter element and a lower end extending downwardly into one of said air inlet chambers, said elongated silencing pipes providing air passage ways between the air inlet chambers and the upper air chamber;

whereby air flowing in through an air inlet port is caused to flow upwardly through the air inlet chambers and upwardly through the silencing pipes into the upper air chamber and then downwardly through the porous air-filtering section of said filter element into the central clean-air chamber to the internal combustion engine.

4,681,609

TOP LOADING AND INVERTED BACKFLUSHED AIR FILTER SYSTEMS

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation-in-part of Ser. No. 549,924, Nov. 7, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 657,712

Int. Cl.[4] B01D *46/04, 29/38*

U.S. Cl. 55—302 **32 Claims**

1. Apparatus for separating particulate material from an air flow stream comprising:

a housing including a first housing section forming a material separation chamber and second housing section forming a clean air chamber;

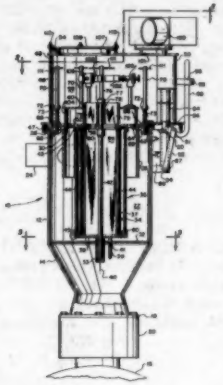
an inlet conduit in communication with said housing for conducting air laden with particulate material into said separation chamber;

a transverse wall of said first housing section, defining part of said separation chamber;

means forming a bore opening through said transverse wall of said first housing section into said housing and of sufficient diameter to permit insertion and removal of a barrier type filter element with respect to said separation chamber;

a barrier type filter element;

a transverse wall of said second housing section defining part of said clean air chamber and forming an opening for conducting filtered air from said filter element to said clean air chamber, said transverse wall of said second



housing section including means for sealingly supporting said filter element in said separation chamber in such a way that said filter element is insertable in and removable from said bore and with respect to said transverse wall of said first housing section without requiring entry into said separation chamber;

means for sealing between said first and second housing sections; and

means for releasably securing said second housing section to said first housing section whereby said second housing section may be moved clear of said bore in said transverse wall of said first housing section sufficiently to permit removal of said filter element from said first housing section.

4,681,610

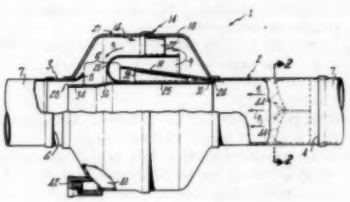
HIGH PERFORMANCE WATER COLLECTOR

John L. Warner, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 13, 1986, Ser. No. 829,049

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—394 **8 Claims**



1. Apparatus, adapted for mounting in a duct having an upstream portion and a downstream portion, for drying a

moisture-laden portion of an airstream flowing through said duct, said apparatus being adapted for use with centrifugal separation means for concentrating said moisture-laden portion along walls of said duct, said apparatus comprising:

an inlet conduit portion attached to said upstream portion of said duct said airstream passing through said inlet conduit portion from said upstream portion,

an outlet conduit portion attached to said downstream portion of said duct said airstream passing through said outlet conduit portion from said inlet conduit portion to said downstream portion,

a diffuser chamber means for drying said moisture-laden portion, said diffuser means surrounding and attached to a portion of said inlet conduit portion and a portion of said outlet conduit portion said diffuser chamber means being in communication with said airstream, and

guide means, extending into said diffuser chamber means and extending into said airstream, said guide means passing said moisture-laden portion from said airstream into said diffuser chamber means, said guide means guiding said moisture-laden portion along a reversing flow path within said diffuser chamber to remove moisture from said moisture-laden portion and said guide means passing a dried portion from said diffuser chamber means to said outlet portion.

4,681,611

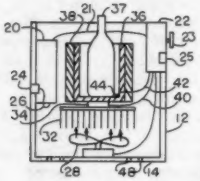
WINE TEMPERATURE CONTROLLER

Hal J. Bohner, 582 Farallon Ave., Pacifica, Calif. 94044

Continuation-in-part of Ser. No. 748,705, Jun. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 604,526, Apr. 27, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,476

Int. Cl.[4] F25B *21/02*

U.S. Cl. 62—3 **11 Claims**



1. A process for maintaining a bottle of wine at substantially a predetermined temperature while the wine is being served, utilizing a portable device capable of maintaining the bottle of wine at substantially a predetermined temperature, the device including heat conduction means which can be located in heat transfer relationship with the bottle, the process comprising:

a. cooling the bottle of wine using a non-portable system;

b. thereafter removing the bottle of wine from the non-portable system and transferring the bottle to the portable device located near the place at which the wine is to be served so that the bottle is in heat transfer relationship with the heat conduction means;

c. maintaining the heat conduction means at substantially the predetermined temperature;

d. measuring a temperature corresponding to the temperature of the wine at a time no less than a predetermined time after the bottle has been transferred to the portable cooling device;

e. determining whether the measured temperature is greater than a second predetermined value;

f. if the measured temperature is greater than the second value, allowing the bottle to remain in heat transfer relationship with the heat conduction means;

g. removing the bottle from the portable device to pour wine into a glass after the measured temperature has reached the second predetermined value; and,

h. returning the bottle to the portable device when the wine is not being poured so that the wine is maintained at substantially the predetermined temperature.

4,681,612

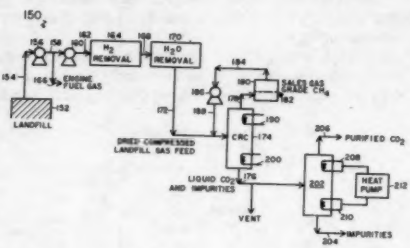
PROCESS FOR THE SEPARATION OF LANDFILL GAS

John V. O'Brien, Shrewsbury, Mass.; Arthur S. Holmes, La-Crosse, Wis., and Richard B. Hopewell, Medfield, Mass., assignors to Koch Process Systems, Inc., Westboro, Mass.

Continuation-in-part of Ser. No. 615,577, May 31, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,311

Int. Cl.[4] F25J *3/06*

U.S. Cl. 62—23 **31 Claims**



1. A recycle process for the separation of a landfill feed gas stream, having a high concentration of methane and carbon dioxide and containing undesirable trace gas impurities, into a fuel-or sales-grade gas methane product stream and a liquid carbon dioxide product stream, which process comprises:

(a) introducing an essentially hydrogen-free, dried, compressed, landfill feed gas stream into a cryogenic distillation column;

(b) withdrawing a methane-enriched overhead product stream from said distillation column;

(c) withdrawing an enriched liquid carbon dioxide bottom product stream, containing a major amount of the undesirable impurities, from said distillation column;

(d) introducing the methane-enriched overhead product stream into a gas-permeation membrane apparatus;

(e) withdrawing from said membrane apparatus a sales- or fuel-grade gas methane product stream;

(f) withdrawing from said membrane apparatus a carbon-dioxide-enriched gas permeate stream;

(g) compressing the carbon-dioxide-enriched gas permeate stream; and

(h) recycling the compressed permeate stream for use in the process.

4,681,613

SLAG FURNACE MELT FLOW CONTROL VALVE

William F. Porter, Lake Zurich, Ill., assignor to USG Acoustical Products Company, Chicago, Ill.

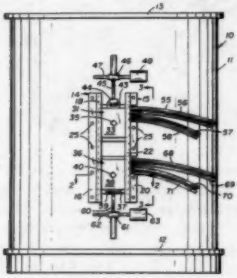
Filed Mar. 21, 1986, Ser. No. 842,525

Int. Cl.[4] C03B *37/06*

U.S. Cl. 65—1 **10 Claims**

1. In an apparatus including a furnace having at least one wall and adapted to heat mineral slag to a temperature above its melting point and to discharge a molten stream of said slag onto an apparatus for fiberization of the slag into mineral wool, the improvement which comprises a valve assembly including retaining bracket means affixed to said wall, and a valve mounted in said bracket means, said valve comprising a first valve member formed of a metal plate fixedly mounted in said bracket means, and a second valve member formed of a metal plate slidably mounted in said bracket means, each of said valve members having an aperture provided therein for passing molten slag, the apertures of said first and second valve members being juxtaposed in the open condition of said valve

and being non-juxtaposed in the closed condition thereof, the apertures being so contoured that, as the valve members move toward closed position, the resultant effective opening of the valve retains a uniform cross-section, wherein each valve member has an internal channel provided therein for circulating water, and duct means connected thereto for transporting water to and from the internal channels of said valve members, and power-operated means for moving said second movable valve member between open and closed position, and to any intermediate position.



4,681,614

METHOD OF MANUFACTURING GLASS BODIES

Rolf Clasen, and Heinz Scholz, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,250

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511439

Int. Cl.⁴ C03B *37/016*

U.S. Cl. 65—18.1 **5 Claims**

1. In a method of manufacturing glass bodies in which a starting material for the glass body, in the form of microdispersed SiO_2 particles, is used to form an open-pore green body, this green body is subjected to a purification process treatment with a purifying gas reactible with impurities present in the green body, the improvement wherein the green body to be purified is positioned in a sealable container, the container containing said green body is flushed with a purification gas and is then sealed, the green body is heated to a temperature of 600°–900° C. while in said container, the container is evacuated to remove said purification gas and gaseous reaction products from said container and repeating said steps of flushing said green body with a purification gas, heating said body while in contact with said purification gas and evacuating said purification gas and gaseous reaction products from said container are repeated the number of times necessary to provide the green body with a sufficiently small concentration of impurities throughout its entire cross section.

4,681,615

SILICA GLASS FORMATION PROCESS

Motoyuki Toki; Sadao Kanbe; Satoru Miyashita, and Tetsuhiko Takeuchi, all of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

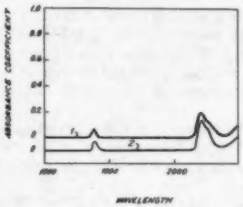
PCT No. PCT/JP83/00450, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02519, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 22, 1983, Ser. No. 642,606

Claims priority, application Japan, Dec. 23, 1982, 57-228198; Sep. 16, 1983, 58-170643; Sep. 16, 1983, 58-170644; Dec. 16, 1983, 58-237577

Int. Cl.⁴ C03B *19/06*

U.S. Cl. 65—18.1 **21 Claims**



1. A process for forming a monolithic silica glass article, comprising;

hydrolyzing a silicon alkoxide in solution to form a hydrolyzed solution;

adding fumed silica to the hydrolyzed solution in an amount between about 0.2 to 5 mols of silica per mol of silicon alkoxide to form a sol solution;

gelling the sol solution to form a gel;

drying the gel to a dry gel; and

sintering the dry gel at a temperature effective to form a glass in order to form a large monolithic silica glass article without cracking.

4,681,616

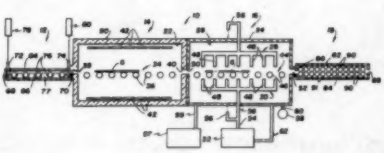
GLASS SHEET TEMPERING METHOD AND FURNACE

Harold A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Division of Ser. No. 754,572, Jul. 15, 1985, Pat. No. 4,620,864, which is a continuation-in-part of Ser. No. 633,637, Jul. 23, 1984, abandoned. This application May 15, 1986, Ser. No. 863,327

Int. Cl.⁴ C03B *27/04*

U.S. Cl. 65—114 **13 Claims**



1. A glass sheet furnace for use in a glass sheet processing system, said furnace comprising: an enclosed heating chamber that is pressurized with an ambient at superatmospheric pressure; a forced convection heater for directing heated gas flow towards opposite surfaces of a glass sheet within the heating chamber to provide rapid heating of the glass sheet; an entrance station in communication with the heating chamber for introducing a glass sheet to be heated into the heating chamber; and means for maintaining the superatmospheric pressure within the heating chamber during glass sheet transfer between the heating chamber and the entrance station.

8. A method for heating a glass sheet comprising: positioning

a glass sheet within an enclosed heating chamber having an ambient at superatmospheric pressure; directing heated gas flow to impinge against opposite surfaces of the glass sheet to provide rapid heating of the glass sheet, transferring a glass sheet to be heated from an entrance station to the heating chamber and maintaining the superatmospheric pressure in the heating chamber during the step of transferring.

4,681,617

PHOSPHOLIPID COMPOSITIONS AND THEIR USE IN PLANT PROTECTION SPRAY MIXTURES

Miklos Ghyczy, Cologne; Paul-Robert Imberge, Pulheim, and Armin Wendel, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie, GmbH, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 508,662, Jun. 28, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,967

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225703

Int. Cl.[4] **A01N** *57/00;* **B01F** *17/34;* **B01J** *13/00*

U.S. Cl. 71—86 **8 Claims**

1. A phospholipid concentrate suitable as an auxiliary agent in the production and application of plant protectant spray mixtures comprising

(a) 5 to 60 weight percent natural or synthetic phospholipid from the group consisting of phosphatidyl choline, hydrogenated phosphatidyl choline, phosphatidyl ethanol amine, N-acyl phosphatidyl ethanol amine, phosphatidyl inositol, phosphatidyl serine, phosphatidyl glycerin, phosphatidic acid and mixtures thereof:

(b) 5 to 62.5 weight percent physiologically acceptable solvent from the group consisting of an alcohol, an ether, a ketone, dimethyl sulfoxide and mixtures thereof;

(c) 3.3 to 30 weight percent non-iogenic co-emulsifier comprising ethoxylates of fatty alcohols or hydrogenated castor oil or nonyl phenol or fatty acid amides; and

(d) 3.3 to 35 weight percent dissolving intermediaries from the group consisting of sorbitan fatty acid esters, the triglyceride or partial glyceride mixtures of saturated fatty acids and the hydroxy ethyl amides.

7. A spray mixture containing water, a plant protectant and a phospholipid concentrate according to claim 1 wherein the ratio by weight of plant protectant to phospholipid concentrate is from 1:0.5 to 1:5.

4,681,618

1-ARYL-5-HALO-4-NITOPYRAZOLES, HERBICIDAL COMPOSITIONS CONTAINING THEM, AND HERBICIDAL METHOD OF USING THEM

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Colonge, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

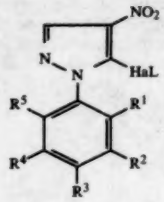
Filed Jan. 6, 1986, Ser. No. 816,643

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501323

Int. Cl.[4] **A01N** *43/56;* **C07D** *231/16*

U.S. Cl. 71—92 **6 Claims**

1. A 1-aryl-4-nitropyrazole of the formula (I),



(I)

in which

Hal represents halogen,

R^1 and R^3 independently of one another represent cyano, or halogen, or represent in each case straight-chain or branched alkyl, alkoxy or alkoxycarbonyl with in each case 1 to 4 carbon atoms, or represent in each case straight-chain or branched halogenoalkyl or halogenoalkoxy with in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or represent a radical $-S(O)_n-R^6$ and

R^2, R^4 and R^5 independently of one another and independently of R^1 and R^3 represent the same radicals as R^1 and R^3 and also represent hydrogen,

and wherein

R^6 represents amino, or in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts and, in the case of halogenoalkyl, with 1 to 9 identical or different halogen atoms and

n represents the number 0, 1 or 2.

6. A method of combatting weeds, wherein a herbicidally effective amount of a 1-aryl-4-nitro-pyrazole of the formula (I) according to claim 1 is applied to the weeds and/or their environment.

4,681,619

N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

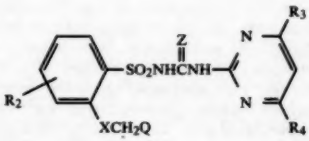
Continuation of Ser. No. 458,595, Jan. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 423,352, Sep. 24, 1982, abandoned, which is a division of Ser. No. 282,779, Jul. 13, 1981, abandoned. This application Aug. 2, 1985, Ser. No. 761,941

Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81

Int. Cl.[4] **C07D** *239/69;* **A01N** *43/54*

U.S. Cl. 71—92 **18 Claims**

1. A compound selected from the group consisting of an N-phenylsulfonyl-N'-pyrimidinylurea of the formula:



wherein

Q is $-CH_2Cl$, $-CCl_3$, $-CHClCH_2Cl$, $-CHBrCH_2Br$, $-CHClCHClCH_3$, $-CHBrCHBrCH_3$, $-CHBrCBr(CH_3)_2$, $-CBr(CH_3)CH_2Br$, or $-CCl(CH_3)CH_2Cl$;

X is —S—, —O—, —SO— or SO_2—;

Z is O, or S;

R_2 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, nitro, $-YR_5$, —COOR6, or

in which

Y is —O—, —S—, —SO— or —SO_2—;

each of R_5 and R_6 is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and

each of R_7 and R_8 independently of the other is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and

each of R_3 and R_4 independently of the other is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, halo, or alkoxyalkyl of 2 to 4 carbon atoms; and

the amine, quaternary ammonium, alkali metal, and alkaline earth metal salts thereof.

14. A herbicidal and growth regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,681,620

SULFONYLUREAS AND SULFONYLTHIOUREAS, AND METHOD OF USE THEREOF AS HERBICIDES AND/OR GROWTH REGULATORS

Beat Böhner, Binningen; Werner Föry, Basel; Rolf Schurter, Binningen, all of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

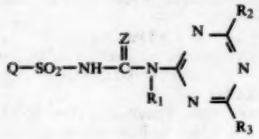
Division of Ser. No. 496,325, May 19, 1983, Pat. No. 4,612,037. This application Mar. 21, 1986, Ser. No. 842,696

Claims priority, application Switzerland, May 28, 1982, 3314/82

Int. Cl.[4] C07D *403/12;* **A01N** *43/66, 43/70*

U.S. Cl. 71—93 **15 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or C_1–C_5alkyl,

R_2 and R_3, each independently of the other, are hydrogen, C_1–C_5alkyl, C_1–C_5alkoxy, C_1–C_5alkylthio, C_1–C_5haloalkyl, halogen, C_1–C_5haloalkylthio, C_1–C_4alkylamino, C_1–C_4dialkylamino, an alkoxyalkyl group or alkoxyalkoxy group, each containing not more than 6 carbon atoms,

Z is oxygen or sulfur, and

Q is a 6-membered heterocyclic group selected from pyrimidine, pyridazine, pyrazine, and triazine and bound through a carbon atom, said group being unsubstituted or substituted by one or two members selected from halogen, pseudohalogen, nitro, C_1–C_6alkyl, C_1–C_6haloalkyl, C_1–C_6alkoxy, C_1–C_6alkylthio, C_1–C_6haloalkoxy, C_1–C_6haloalkylthio, amino, C_1–C_6alkylamino, di-C_1–C_6-alkylamino, C_1–C_6alkylcarbonylamino, C_1–C_6alkylcarbonyl, C_1–C_6alkoxycarbonyl, C_1–C_6alkylthiocarbonyl, carbamoyl, C_1–C_6alkylaminocarbonyl, C_1–C_6dialkylaminocarbonyl, C_1–C_6alkylsulfinyl, C_1–C_6lkylsulfonyl, C_2–C_6alkenyloxy, C_2–C_6alkynyloxy, or by phenyl, phenoxy or phenylthio, which are unsubstituted or substituted by halogen, nitro, cyano, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl or C_1–C_6haloalkoxy, or by benzyl or benzyl substituted by halogen and/or C_1–C_6alkyl,

or salt thereof.

10. A composition which contains a herbicidally and/or growth regulatingly effective amount of a compound according to claim 1 as active component and a carrier.

4,681,621

HERBICIDAL 2-(2-SUBSTITUTED BENZOYL)-1,3-CYCLOPENTANEDIONES

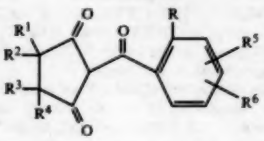
David L. Lee, Martinez, and William J. Michaely, Richmond, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 683,883, Dec. 20, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,027

Int. Cl.[4] A01N *41/10, 33/20*

U.S. Cl. 71—103 **14 Claims**

1. A compound of the formula

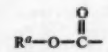


wherein

R is halogen; C_1–C_4 alkoxy; nitro; cyano; —$S(O)_nR'$ wherein n is the integer 0, 1, or 2, and R' is C_1–C_4 alkyl; or R is is C_1–C_4 alkyl optionally substituted with halogen;

R^1 is hydrogen or C_1–C_4 alkyl;

R^2 is hydrogen, C_1–C_4 alkyl or



wherein $R^a$is C_1–C_4 alkyl; or

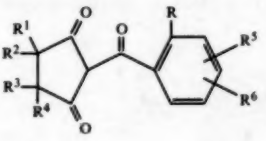
R^1 and R^2 together are alkylene having 3 to 6 carbon atoms;

R^3 is hydrogen or C_1–C_4 alkyl;

R^4 is hydrogen or C_1–C_4 alkyl;

R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) OCF_3; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1, or 2; and $R^b$is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined.

8. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein

R is halogen; C_1–C_4 alkoxy; nitro; cyano; —$S(O)_nR'$ wherein n is the integer 0, 1, or 2, and R' is C_1–C_4 alkyl; or R is is C_1–C_4 alkyl optionally substituted with halogen;

R^1 is hydrogen or C_1–C_4 alkyl;

R^2 is hydrogen, C_1–C_4 alkyl or

wherein R^a is C_1–C_4 alkyl; or
R^1 and R^2 together are alkylene having 3 to 6 carbon atoms;
R^3 is hydrogen or C_1–C_4 alkyl;
R^4 is hydrogen or C_1–C_4 alkyl;
R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4; (5) OCF_3; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1, or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR_d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$— wherein R^e is C_1–C_4 or C_1–C_4 alkoxy; or (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined.

4,681,622

SUBSTITUTED PHENOXYBENZOIC ACIDS AND DERIVATIVES THEREOF AS HERBICIDES

Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Continuation of Ser. No. 490,357, May 2, 1983, abandoned, which is a continuation of Ser. No. 181,491, Sep. 4, 1980, abandoned, which is a continuation of Ser. No. 837,957, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 702,367, Jul. 2, 1976, Pat. No. 4,606,758, which is a continuation-in-part of Ser. No. 617,569, Sep. 29, 1975, Pat. No. 3,979,437, which is a continuation of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830, which is a continuation of Ser. No. 114,712, Feb. 11, 1971, Pat. No. 3,784,635, which is a continuation-in-part of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645, said Ser. No. 702,367, is a continuation-in-part of Ser. No. 545,232, Jan. 29, 1975, Pat. No. 4,002,662, which is a continuation-in-part of Ser. No. 398,610, Sep. 19, 1973, Pat. No. 3,941,830. This application Mar. 9, 1984, Ser. No. 587,973

The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.

Int. Cl.[4] A01N *33/22*

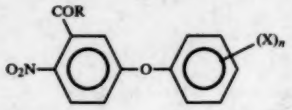
U.S. Cl. 71—108 **15 Claims**

1. An herbicidal composition comprising as an effective herbicide, a herbicidally effective quantity of 2-nitro-5-(substituted-phenoxy) benzoic acid, salts thereof selected from the group consisting of lithium salts, sodium salts, potassium salts, alkylammonium salts of 1 to 4 carbon atoms and alkanolammonium salts of 1 to 4 carbon atoms, alkyl esters thereof of 1 to 5 carbon atoms and the phenyl ester thereof, wherein said phenoxy is substituted only by a combination of two members selected from the group consisting of halogen, trifluoromethyl, COOH,

alkyl of 1 to 4 carbon atoms), hydroxy, alkoxy of 1 to 4 carbon atoms,

SH, SR_1, SOR_1, SO_2R_1, SO_2NH_2 wherein R_1 and R_2 are selected from the group consisting of alkyl of 1 to 4 carbon atoms, and an agronomically acceptable carrier selected from the group consisting of solid carriers, water and organic solvents.

8. A method for controlling plant growth which comprises applying a composition consisting essentially of: an herbicidal amount of a compound having the formula:



wherein $(X)_n$ is a combination of the members selected from the group consisting of halogen, trifluoromethyl, COOH,

(alkyl having 1 to 4 carbon atoms), hydroxy, alkoxy having 1 to 4 carbon atoms,

SH, SR_1, SOR_1, SO_2R_1, SO_2NH_2; R_1 and R_2 are selected from the group consisting of alkyl having 1 to 4 carbon atoms, R is selected from the group consisting of hydroxy, alkoxy having 1 to 5 carbon atoms, and OM wherein M is an alkali metal of lithium, sodium or potassium, alkylammonium having 1 to 4 carbon atoms or alkanolammonium having 1 to 4 carbon atoms and n is the integer 2; and an agronomically acceptable carrier selected from the group consisting of solid carriers, water and organic carriers.

4,681,623

PROCESS FOR PRODUCING ALLOY POWDER CONTAINING RARE EARTH METALS

Yasuhiro Okajima; Yasuhiro Tsugita, both of Niihama; Tamaki Takechi, Saijyo, and Syuji Okada, Mitoyo, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,128

Claims priority, application Japan, Jun. 24, 1985, 60-137512

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 B **13 Claims**

1. In a process for producing an alloy powder containing rare earth metals which includes the steps of (a) preparing a mixture containing a powder of rare earth metal oxide, a powder of a metal which is difficult to volatize at 900°–1300° C., and a reducing agent, (b) heating the mixture to between 900° and 1300° C. in an inert atmosphere or under vacuum to produce a reaction mixture, and (c) treating the reaction mixture in a wet process to produce the alloy powder containing rare earth elements, the improvement wherein in step (a) at least one chloride selected from alkali metal chlorides and alkaline earth metal chlorides is added to said mixture so that the produced alloy powder will be in a finely divided form and the particles thereof will have a uniform composition and a minimum amount of residual reducing agent and oxygen.

4,681,624

METHOD OF FILTERING MOLTEN METALS USING A MONOLITHIC REFRACTORY HONEYCOMB FILTER

Thomas P. DeAngelis, Horseheads, and John P. Day, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

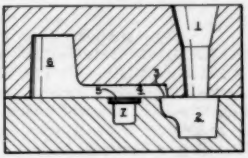
Filed Apr. 26, 1985, Ser. No. 727,529

Int. Cl.[4] C22B *9/02*

U.S. Cl. 75—28 **12 Claims**

1. In a method of removing impurities from molten metal by

passing the molten metal through a filter, the improvement comprising providing as the filter a monolithic refractory honeycomb filter consisting essentially of 50-100% by weight of zircon and 0-50% by weight of an oxide selected from the group consisting of magnesium oxide, zinc oxide, cerium oxide, chromium oxide, manganese oxide, titanium oxide, iron



oxide, copper oxide, nickel oxide, and mixtures of these; said filter having a frontal contact surface containing 50-400 open cells per square inch; said open cells defining 60-75% of the frontal surface area and extending substantially longitudinally from the frontal surface through the filter so as to be open at both ends for passage therethrough of the molten metals.

4,681,625

METHODS FOR SIMULTANEOUSLY DESULFURIZING AND DEGASSING STEELS

William G. Wilson, 820 Harden Dr., Pittsburgh, Pa. 15229

Continuation-in-part of Ser. No. 203,315, Nov. 3, 1980, Pat. No. 4,570,692. This application Nov. 21, 1985, Ser. No. 800,544

Int. Cl.[4] C21C *7/02*

U.S. Cl. 75—53 **31 Claims**

1. The method for removing sulfur and hydrogen from steel comprising the steps of:

(a) pouring a stream of steel, low in oxygen and free of slag into a vertical tube installed in a ladle which extends from the bottom of the ladle to the top of the ladle,

(b) providing a means to introduce a flow of inert gas into the bottom of the tube to provide a stirring action within the tube,

(c) adding a lime based slag with a large capacity to absorb sulfur into the tube;

(d) adding ferro-alloys and elemental metals into the tube which are known to enhance desulfurization and are necessary to achieve the specificed composition of the steel;

(e) utilizing the stream of inert gas introduced into the bottom of the tube as a means for hydrogen removal.

4,681,626

METHOD OF REFINING ALUMINUM

Masao Fujishige; Harumi Yokokawa; Seiichi Ujiie, and Masayuki Dokiya, all of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 28, 1986, Ser. No. 823,433

Claims priority, application Japan, Feb. 2, 1985, 60-19106

Int. Cl.[4] C22B *21/02, 7/04*

U.S. Cl. 75—68 A **13 Claims**

1. A method of reducing and refining aluminum which comprises the steps of:

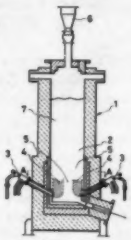
filling a blast furance with a carbon material;

directing oxygen gas into said carbon material so as to form a plurality of combustion regions in which combustion of said carbon material takes place, said combustion regions extending from the periphery of the furnace toward the center thereof, and the carbon material outside said combustion regions constituting a high-temperature reduction zone, whereby said carbon material serves as a combustion agent as well as a reducing agent;

feeding an alumina-containing material and a flux onto the top of said carbon material, allowing the alumina-containing material and flux to be melted by the combustion heat from the burning carbon material, thereby forming a liquid melt mixture of said alumina-containing material and said flux;

allowing said liquid melt mixture to flow down into and through said high-temperature reduction zone and causing the alumina in said alumina-containing material to become partially reduced to aluminum by the carbon material;

taking out of the furnace a crude aluminum alloy comprising (1) calcium carbide formed from the carbon material and



the flux, (2) the carbon material, and (3) the aluminum formed through the above reduction;

hydrogenating said crude aluminum alloy to remove the carbon material and calcium carbide from the crude aluminum alloy and increase the aluminum content of said alloy;

taking out of the furnace a slag and hydrogenating the slag to convert unreacted alumina contained in the slag into aluminum.

4,681,627

PROCESS FOR PREPARING AN INGOT FROM METAL SCRAP

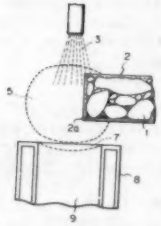
Yoshiharu Mae, Urawa, and Tsutomu Oka, Omiya, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1986, Ser. No. 868,120

Claims priority, application Japan, Jun. 3, 1985, 60-120157; Jun. 3, 1985, 60-120158; Jun. 3, 1985, 60-120159; Aug. 23, 1985, 60-185404

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—10.19 **30 Claims**



1. A process for producing an ingot from metal scrap by first melting the scrap in a vacuum melting furnace and then solidifying the melt in a water-cooled mold into an ingot comprising:

charging the metal scrap into a tubular member with a closed end and another end, said tubular member being made of the same material as that of the scrap;

heating said tubular member with an electron beam or from said closed end toward the other end thereof to heat and melt said tubular member and said scrap charged into said tubular member to form a melt;

said tubular member being held substantially horizontally in

said vacuum melting furnace during said heating step; and a causing the resulting melt to drop into said water-cooled mold wherein it is solidified into an ingot.

4,681,628

GOLD RECOVERY PROCESSES

Arnold F. Griffin, Scarborough, and Warren D. Hinchliffe, Morley, both of Australia, assignors to Norcim Investments Pty. Ltd., Perth, Australia

Filed Apr. 24, 1986, Ser. No. 855,406
Claims priority, application Australia, May 1, 1985, PH0385
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R 11 Claims

1. A process for the recovery of gold from an alkaline aqueous liquid solution containing gold-cyanide ion, and one or more members selected from the group consisting of silver, copper and mercury comprising adding thiourea to the solution so as to allow formation of a gold complex with thiourea in which the gold complex is soluble and stable in an acid solution; adjusting the pH of the solution to an acid pH ranging from 1 to 4 so that gold and mercury remain in solution in the liquid and silver and/or copper is incorporated in a precipitate containing silver and/or copper cyanide compounds; separating the precipitate from the liquid to leave a solution of dissolved gold complex; and recovering the gold from the solution.

4,681,629

POWDER METALLURGICAL PROCESS FOR MANUFACTURING COPPER-NICKEL-TIN SPINODAL ALLOY ARTICLES

John H. Reinshagen, North Huntingdon, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 19, 1985, Ser. No. 811,140
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—246 13 Claims

1. A process for preparing a discrete copper-base spinodal alloy article which comprises the steps of:

(a) providing a prealloyed copper base alloy powder containing from about 5 to about 35 percent by weight nickel, from about 4 to about 13 percent by weight tin, and the balance copper;

(b) compacting the alloy powder to form a green body having structural integrity, sufficient porosity to be penetrated by a reducing atmosphere or a vacuum and substantially the desired size and shape of said article; and

(c) sintering the green body in the reducing atmosphere or a vacuum at a temperature of from about 1700° F. to about 1800° F. for at least about 30 minutes to form a metallurgical bond and achieve a post-sinter alloy body density which is from 90 to 96 percent of the theoretical density of said alloy body.

4,681,630

METHOD OF MAKING COPPER COLLOID FOR ACTIVATING INSULATING SURFACES

William R. Brasch, Nesconset, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 423,749, Sep. 27, 1982, abandoned. This application Apr. 25, 1986, Ser. No. 855,997
Int. Cl.[4] B22F *9/00*
U.S. Cl. 106—1.11 17 Claims

1. A method for preparing a colloidal copper solution for activating non-conductive substrates prior to electroless metal deposition thereon which comprises:

dissolving in water a quantity of at least one copper compound to form a copper solution;

preparing a gelatin solution by mixing gelatin with water;

mixing the gelatin and copper solutions together;

adjusting the pH of the mixed solutions with an acid to a range of less than about 4 but above about 1.5;

preparing a solution of a reducing agent in a quantity in excess of that required to reduce the copper ions; and

mixing the reducing agent solution with the previously mixed solutions to form a colloidal copper solution containing active colloidal copper in the form of copper metal, hydrous copper oxides, or mixtures thereof, wherein the colloidal copper solution remains stable at a neutral pH.

4,681,631

INORGANIC MOLDING COMPOSITION CONTAINING A LITHOGENOUS COMPONENT

Hans-Werner Engels, Troisdorf; Karlheinz Neuschäffer, Leichlingen, and Paul Spielau, Troisdorf-Eschmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 7, 1986, Ser. No. 848,493
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512515; Apr. 6, 1985, 3512516
Int. Cl.[4] C04B *12/04*
U.S. Cl. 106—4 17 Claims

1. An inorganic, aqueous molding composition hardenable at low temperatures, which contains an alkali silicate solution, an inorganic, solid component reactive with the alkali silicate solution, and optionally proportions of fillers and auxiliary materials said composition containing 0.5–4.0 parts by weight of the inorganic solid component per part by weight of the alkali silicate solution; said solid component consisting essentially of

(a) vitreous amorphous electrostatic precipitator ash having 45–60% by weight of vitreous SiO_2, 25–35% by weight of Al_2O_3, and 8–11% by weight of Fe_2O_3, and/or

(b) ground calcined bauxite, and the alkali silicate solution containing 1.2–2.5 moles of SiO_2 per mole of K_2O and/or Na_2O.

4,681,632

SOLID PARTICULATE COLORING COMPOSITION

Richard F. T. Bes, and Jan D. Knol, both of Apeldoorn, Netherlands, assignors to Holland Colours Apeldoorn B.V., Netherlands

Filed Feb. 3, 1986, Ser. No. 825,193
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—19 4 Claims

1. Solid particulate coloring composition in the form of a mixture comprising:

a molten carrier material which is solid at ambient temperature and having a melting point below 250° C.;

at least one compound which is liquid at ambient temperatures and which comprises a liquid stabilizing agent for polymeric materials in the form of an organometal compound;

a pigment or dyestuff; and

a particulate material having a large specific surface, said mixture being divided into particles which are solid under ambient conditions.

4,681,633

HIGH STRENGTH CALCIUM PHOSPHATE GLASS-CERAMIC MATERIALS

Akira Watanabe, Okayama; Yoshimitsu Takeuchi; Seiji Kihara, both of Bizen; Makoto Mitsudoh, Okayama, and Yoh'ichi Wakabayashi, Akasaka, all of Japan, assignors to Kyushu Refractories Co., Ltd., Okayama, Japan

Continuation of Ser. No. 628,748, Jul. 9, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 844,249
Claims priority, application Japan, Oct. 29, 1983, 58-203546
Int. Cl.[4] C03C *10/02*
U.S. Cl. 106—35 1 Claim

1. Dental materials of calcium phosphate glass-ceramics consisting of:

calcium phosphate composite wherein the atomic ratio of calcium to phosphorus Ca/P is 0.35–1.7; and

rare earth oxides wherein the content of said rare earth oxide component is 0.05–10 wt. pt. per 100 wt. pt. of calcium phosphate composite whereby the mechanical strength of the dental materials is improved.

4,681,634
COMPOSITION CIMENTAIRE HYDRAULIQUE A PRISE RETARDEE POUR CIMENTATION A HAUTES TEMPERATURE ET PRESSION

Yves Roca, Leblanc Mesnil; Jacky Rousset, St. Trivier-Sur-Moignens; Pierre Bouchut, Decines; Marie-Christine Leblanc, Boulogne, and Daniel Baffreau, Lavarenne St Hilaire, all of France, assignors to Coatex S.A., Caluire and Total Compagnie Francaise des Petroles S.A., Paris, both of, France

Filed Oct. 16, 1985, Ser. No. 787,902

Claims priority, application France, Oct. 16, 1984, 84 16004

Int. Cl.[4] C04B *7/02, 24/00*

U.S. Cl. 106—90 **16 Claims**

1. A hydraulic cement composition, comprising:

(a) an aqueous liquid phase,

(b) at least one hydraulic cement,

(c) a setting-retarder adjuvant preserving or improving rheological properties, comprising a water-soluble polymer obtained from the copolymerization of $CH_2{=}CR_1{-}COOH$ or maleic anhydride with $CH_2{=}CR_2{-}CONHR_6$ and $CH_2{=}CR_4{-}COO{-}R_3{-}OPO_3H_2$, wherein R_1, R_2 and R_4 are each independently chosen from the group consisting of hydrogen and C_1–C_{18}-alkyls, R_3 is chosen from the group consisting of alkylenes, alkylene oxides and polyalkylene oxides, and R_6 is chosen from the group consisting of hydrogen, alkyls and alkyl sulfonic acids.

4,681,635
TOPICAL COLLODION COMPOSITIONS

Werner K. Stiefel, Coral Gables, Fla., and Charles F. Breunig, Greenville, N.Y., assignors to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Mar. 31, 1986, Ser. No. 846,362

Int. Cl.[4] C08L *1/08, 1/18*

U.S. Cl. 106—178 **5 Claims**

1. In a fluid collodion composition for topical application in which nitrocellulose is dissolved in an ether-alcohol solvent, the improvement which consists essentially of a quantity of D,L-lactic acid being dissolved in said composition, said quantity being at least sufficient to decrease the drying time of said composition without significantly increasing the viscosity of said composition.

4,681,636
BONDING PRIMER COMPOSITION

Masayuki Saito, Ichihara, and Mitsuo Hamada, Kisarazu, both of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,506

Claims priority, application Japan, Jun. 3, 1985, 60-120231

Int. Cl.[4] C09K *3/00;* **B32B** *9/00*

U.S. Cl. 106—287.15 **5 Claims**

1. A primer composition for bonding a silicone rubber composition to a substrate, said composition comprising

A. 100 parts by weight of a silane of the formula

$$R_nSi[OCC(CH_3)_3]_{4-n}$$

where R represents alkyl containing from one to four carbon atoms, aryl, substituted alkyl where the alkyl portion contains from one to four carbon atoms, or substituted aryl where the substituent is halogen and n is 1, 2 or 3;

B. from 5 to 500 parts by weight of an organosilicon compound containing at least two alkoxy groups per molecule and at least one unit corresponding to the average formula

$$R^1_aR^2_b(OR^3)_cSiO_{(4-a-b-c)/2}$$

where R^1 is methyl, ethyl, aryl, substituted methyl, substituted ethyl or substituted aryl where the substituent is a halogen or a cyano group R^2 represents a monovalent radical containing a functional group selected from the group consisting of vinyl, allyl, epoxy, methacryloxy, mercapto, amino and N-aminoalkyl), where said functional group is bonded to silicon directly or by means of a divalent hydrocarbon radical; R^3 is methyl, ethyl, propyl, phenyl, 2-methoxyethyl or 2ethoxyethyl, the value of a is from 0 to 3, inclusive, the value of b is from 0 to 3, inclusive, the value of c is greater than 0 and no greater than 4 and the sum of a+b+c is greater than 0 and no greater than 4;

C. from 0.1 to 50 parts by weight of an organotitanate ester; and

D. an organic liquid in an amount sufficient to solubilize said primer composition.

4,681,637
PROCESS FOR THE PRODUCTION OF YELLOW-BROWN ZINC FERRITE PIGMENTS

Jakob Rademachers; Karlheinz Turban; Gerhard Franz; Werner Fuhr, and Bernd Holle, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,902

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409722

Int. Cl.[4] C09C *1/62*

U.S. Cl. 106—304 **10 Claims**

1. A process for the production of an anisometric yellow-brown zinc ferrite pigment consisting essentially of homogenously mixing zinc oxide having a specific BET surface of more than 2 m^2/g with needle-shaped α-FeOOH obtained from an iron salt solution by mixing with alkali and subsequently oxidizing in a nucleation and pigment growth stage, the FeOOH having a specific BET surface of about 15 to 25 m^2/g, an average needle width of about 0.025 to 0.125 μm and an average needle length of about 0.2 to 0.6 μm, annealing the mixture at a temperature of about 700° to 1000° C. in the absence of a chloride catalyst, cooling and grinding.

4,681,638
IRON BLUE PIGMENTS AND PROCESS FOR PREPARATION

Robert C. Schiek, Glens Falls, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 681,044, Dec. 13, 1984, abandoned. This application May 2, 1986, Ser. No. 861,645

Int. Cl.[4] C09C *3/06*

U.S. Cl. 106—309 **11 Claims**

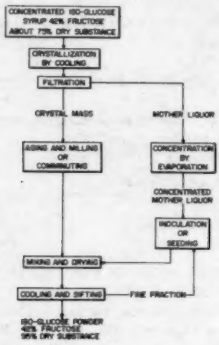
1. In the process for the production of iron blue pigment comprising the reaction of ferrous sulfate, alkali metal or ammonium sulfate and alkali metal ferrocyanide to produce a white paste, the subsequent heating and oxidation of said white paste and the isolation of the iron blue pigment, the improvement comprising adding from about 0.3–1.2%, based on weight of ferrous sulfate, of a source of zinc ions to the reaction mix prior to the oxidation step.

4,681,639

PROCESS FOR TREATING AND CONVERTING OF ISO-GLUCOSE SIRUP

Karl-Heinz Hinck, Tornesch, Fed. Rep. of Germany, assignor to Starcosa GmbH, Brunswick, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 616,245, Jun. 1, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,851
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320602
Int. Cl.[4] C13F *1/02, 3/00*
U.S. Cl. 127—30 10 Claims



1. A process for treating and converting iso-glucose sirup to form a flowable dry end product, said iso-glucose sirup including fructose to the extent of about 42 to 45% by weight of the sirup, comprising the following steps:

(a) concentrating said iso-glucose sirup by evaporation to produce a concentrated sirup containing dry substance of about 70 to 77% by weight of the concentrated sirup;

(b) crystallizing said concentrated sirup by a first cooling step at a cooling temperature within the range of 30° C. to 18° C. to produce a predominantly glucose containing crystal mass;

(c) separting fructose containing mother liquor from said crystal mass;

(d) aging said crystal mass, to which mother liquor is still adhering, for at least several hours in a batch or pile for causing an after-crystallization to produce an aged crystal mass;

(e) comminuting or milling said aged crystal mass to form a crystal powder having a particle size in the range from about 10 micron to about 250 micron;

(f) concentrating said mother liquor containing said fructose, by evaporation to produce a concentrated mother liquor containing dry substance to the extent of about 90% by weight of the concentrated mother liquor;

(g) mixing said crystal powder and said concentrated mother liquor while simultaneously drying said crystal powder and concentrated mother liquor to produce a mixture containing maximally 42 to 45% of fructose by weight of dry substance;

(h) performing a second cooling step by cooling said mixture of step (g) while keeping said mixture in motion; and

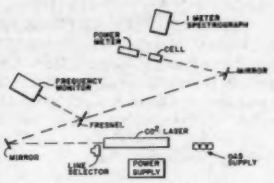
(i) sifting said mixture, said steps avoiding the use of any organic solvents to produce said dry flowable end product.

4,681,640

LASER-INDUCED CHEMICAL VAPOR DEPOSITION OF GERMANIUM AND DOPED-GERMANIUM FILMS

Ann E. Stanley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1986, Ser. No. 893,837
Int. Cl.[4] H01L *21/265;* B05D *3/06*
U.S. Cl. 148—1.5 12 Claims



1. A method for infrared laser-induced chemical vapor deposition of polycrystalline germanium and doped-germanium films wherein in said method as said deposition increases in amount the rate of said deposition does not decrease because of the transparency of said deposited polycrystalline germanium or doped-germanium films to the output frequencies of the infrared laser inducing said deposition, said method comprising:

i. placing a prepared substrate into one or more laser reaction cells;

ii. filling one or more laser reaction cells with one or more compounds selected from germane, ethylgermane, diethylgermane, triethylgermane, tetramethylgermane, dimethylcadmium, and trimethylaluminum to a predetermined pressure from about 3.5 to about 220 torr;

iii. irradiating said compound with infrared laser radiation in the range of 10.4 or 9.4 micrometer as provided by a continuous-wave CO_2 laser whose single-line operation is varied in output powers between 10 and 150 watts/cm^2;

iv. continuing said irradiating for a predetermined time period from about 15 seconds to about one minute to effect laser photochemical dissociation of said compound contained in said laser reaction cell; and,

v. repeating said irradiating for an additional predetermined time period from about 15 seconds to about one minute as required to achieve said infrared laser-induced chemical vapor deposition of polycrystalline germanium or doped-germanium films.

4,681,641

ALKALINE RESISTANT PHOSPHATE CONVERSION COATINGS

Ronald W. Zurilla, Farmington Hills, and John Huff, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 574,851, Jan. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 422,971, Jul. 12, 1982, abandoned. This application May 16, 1985, Ser. No. 735,286
Int. Cl.[4] C23C *22/12, 22/13*
U.S. Cl. 148—6.15 Z 10 Claims

1. A method for increasing the resistance to alkaline dissolution of a phosphate conversion coating on a corrodible metal substrate, said coating being deposited by exposing said substrate to an acidic, aqueous solution containing first and second divalent metal cations and phosphate ions, the method comprising:

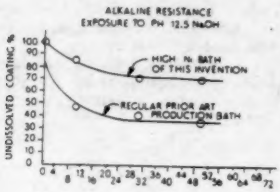
(a) selecting nickel cations as said first divalent metal cations;

(b) selecting zinc cations as said second divalent metal cations;

(C) maintaining a minimum zinc ion concentration in said solution of 0.2 grams per liter;

(d) controlling the concentrations of said first and second

divalent metal cations in said aqueous solution so that the concentration of said nickel cations is maintained at the


ALKALINE RESISTANCE
EXPOSURE TO PH 12.5 NaOH
UNDISSOLVED COATING %
HIGH Ni BATH OF THIS INVENTION
REGULAR PRIOR ART PRODUCTION BATH

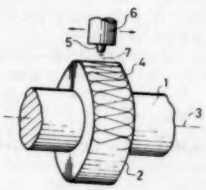
time of coating between about 84 and about 94 mole percent of the total first and second divalent metal cations in said solution.

4,681,642

CAST IRON MAKING BY CERIUM ADDITION

Hideo Nonoyama; Toshiharu Fukuizumi, and Akiyoshi Morita, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 20, 1985, Ser. No. 800,153
Int. Cl.[4] C22C *37/00*
U.S. Cl. 148—321 **2 Claims**



1. A method for preparing a chilled cast iron article having a chilled layer which comprises:

(a) adding a mischmetal to an iron material free of magnesium having a C.E. value of not more than 4.3 so as to provide a cerium content of from 0.005 to 0.035% by weight,

(b) casting said iron material containing cerium, and

(c) remelting by means of a high density energy source at least a portion of the surface of the cast iron.

4,681,643

FAST BURNING PROPELLANTS

Stirling A. Colgate, 4616 Ridgeway, Los Alamos, N. Mex. 87544, and George E. Roos, P.O. 284, Burns Flat, Okla. 73624

Continuation-in-part of Ser. No. 220,975, Dec. 29, 1980, abandoned. This application Oct. 3, 1983, Ser. No. 538,578
Int. Cl.[4] C06B *45/02*
U.S. Cl. 149—21 **33 Claims**

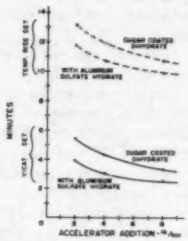
1. A solid or semisolid propellant comprising grains of propellant or propellant components bonded together so as to create voids within the propellant volume, said grains being of near-uniform size such that they have less than about a 20% size variation between the largest and smallest grains, said voids comprising from about 10% to about 50% of the propellant volume, said grains bonded together with sufficient strength to substantially delay the fluidization of the propellant by the onset of Taylor unstable burning, said propellant thereby having a rapid burn rate of from about 10 cm sec^{-1} to about 10^4 cm sec^{-1}.

4,681,644

ACCELERATOR FOR GYPSUM PLASTER AND PROCESS OF MANUFACTURE

Otto L. Dozsa, Palos Heights, Ill., assignor to USG Corporation, Chicago, Ill.

Filed Sep. 27, 1985, Ser. No. 780,921
Int. Cl.[4] B32B *31/06, 13/00*
U.S. Cl. 156—39 **16 Claims**



14. A method of making gypsum wallboard, comprising

(a) forming a dry accelerator composition comprising finely ground calcium sulfate dihydrate having a coating of sugar and having thereover a consolidation therewith of aluminum sulfate hydrate;

(b) mixing a minor proportion of said accelerator composition and a major proportion of calcium sulfate hemihydrate with water to form an aqueous slurry;

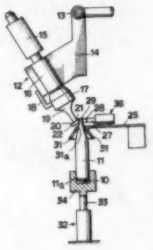
(c) depositing said slurry on a surface and permitting said slurry to set, and drying the gypsum wallboard formed thereby.

4,681,645

METHOD AND APPARATUS FOR FUSING TOGETHER THE BOTTOM OF TUBULAR CONTAINER FORMED OF SYNTHETIC RESIN

Shoji Fukushima; Motosaburo Kato; Takashi Mochizuki, and Yukio Wada, all of Shizuoka, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan

Filed Aug. 5, 1985, Ser. No. 762,820
Claims priority, application Japan, Aug. 7, 1981, 56-123692; May 24, 1982, 57-87765
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—73.1 **4 Claims**



1. A method for fusing together the bottom of a tubular container made of synthetic resin, which comprises:

clamping a shoulder of a cylindrical and tubular container which is filled in with its charge and formed of flexible synthetic resin which is capable of being fused by ultrasonic vibrations in clamp means formed at the upper end of a movable rod of an elevator device, said container having its mouth closed by a cap in an openable manner and positioned downwardly,

forcing the upper end of said tubular container into a rectangular and horizontal through-hole formed in the top edge of a downward umbrella-shaped guide formed as one piece by means of said elevator device, thereby to define a flattened portion on the upper end of said tubular container, said flattened portion having its inner faces spaced apart from each other,

and successively flattening the upper end of said tubular container by continuing said forcing of the upper end of said tubular container into said rectangular and horizontal through hole,

said forcing continuing until the flattened portion extends completely above said through hole and until the upper end of said tubular container is coincident with the upper edge of plate means movable in a horizontal plane,

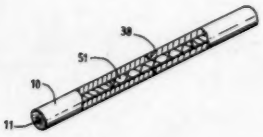
urging said flattened portion projecting from the upper end of said umbrella-shaped guide against a flat urging face of a vibratory terminal formed at the end of a horn portion of an ultrasonic generator which generates ultrasonic waves oscillating in the direction extending at an angle of 10°–45° with respect to the lengthwise direction of said tubular container, said urging being carried out with the use of said plate means formed at the end of a horizontally movable rod of an urging device, thereby to bring said spaced apart inner faces into close contact with each other, said flat urging face of said ultrasonic generator being parallel with the said flattened portion and said flattened portion being positioned completely between said plate means and said flat urging face, and applying ultrasonic waves by said generator to said flattened portion projecting from the upper end of said umbrella-shaped guide and having its inner faces brought into close contact with each other, whereby the inner faces of said flattened portion are fused together.

4,681,646

METHOD FOR SPLICING OF ELASTOMERIC BELTS

Gideon Pinto, Carmiel, and Jonathan Schanin, Haifa, both of Israel, assignors to Volta Power Belting, Ltd., B'Nai Brak, Israel

Filed Jun. 11, 1985, Ser. No. 743,612
Claims priority, application Israel, Jul. 30, 1984, 72538
Int. Cl.[4] B65H *69/06*
U.S. Cl. 156—157 **9 Claims**



1. A method of splicing the ends of elastomeric belts having one or more reinforcing members embedded therein and extending in the longitudinal direction thereof, said method comprising the steps of:

(a) providing one or more cavities in said ends where said one or more reinforcing members were formerly located and

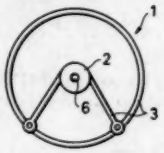
(b) subsequently butt-joining said ends, thereby splicing said ends together to form a continuous belt.

4,681,647

METHOD FOR JOINING A FIBER-REINFORCED PLASTIC STRUCTURE

Katsumi Kondo; Yasuhiro Tsuchiya, both of Toyota; Takatsune Niimi, Aichi; Takashi Yamamoto, Ichinomiya, and Kunihiro Matsuba, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 18, 1985, Ser. No. 745,931
Claims priority, application Japan, Jun. 19, 1984, 59-126241
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—172 **2 Claims**



1. A method for making a rotatable element including a metallic insert, a rim portion and spokes connecting the insert and rim portion, said method comprising the steps of:

(i) winding a resin-impregnated strand of continuous long-staple fibers around an engaging member formed on a fitting means in the form of a metallic insert by winding said resin-impregnated strand of continuous long-staple fibers in a repeated pattern around a substantial circumferential portion of said insert while placing said fibers in a zig-zag pattern about a multiplicity of radially extending engaging pins provided on said metallic insert; and

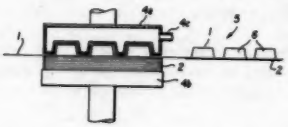
(ii) forming said spokes and rim with said strands, said spokes extending outwardly from said metallic insert.

4,681,648

PROCESS FOR PRODUCING CUSHIONING LAMINATE

Atsushi Maeda, Mie, Japan, assignor to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Mar. 21, 1985, Ser. No. 714,267
Claims priority, application Japan, May 16, 1984, 59-98313
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—210 **8 Claims**



1. A process for producing a cushioning laminate which comprises:

heat-melting a laminated sheet comprising (a) a rigid thermoplastic resin formed polystyrene substrate sheet and (b) a thermoplastic resin adhesive layer having a heat distortion temperature at least 25° C. lower than that of the thermoplastic resin which constitutes the substrate sheet (a),

moving the laminate sheet below an upper mold in such a manner that the substrate sheet (a) is positioned so as to face the upper mold,

vacuum molding the laminated sheet using the upper mold to produce a molded article having a desired irregular surface, and

bonding a cardboard plate-shaped member having a high stiffness to the adhesive layer (b) of the laminated sheet while the above-molded article is brought into close contact with the upper mold by vertically raising said cardboard plate-shaped member to contact the adhesive

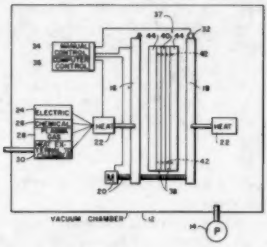
layer, thereby producing the cushioning laminate having closed air pockets.

4,681,649

MULTI-LAYER PRINTED CIRCUIT BOARD VACUUM LAMINATION METHOD

Fazal A. Fazlin, 12000 - 28th St., North, St. Petersburg, Fla. 33702

Filed Apr. 15, 1985, Ser. No. 723,607
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—285 **3 Claims**



1. A method for laminating the layers of a book composed of printed circuit layers and adhesive layers comprising the steps of:

providing a vacuum chamber including a pair of spaced apart chamber platens;

loading the book between the pair of chamber platens within the chamber;

closing the chamber;

evacuating the chamber;

moving the chamber platens together to a prespecified distance apart;

allowing activation and curing of the adhesive of the adhesive layer including the application of heat to the chamber platens at a prespecified temperature and duration by creating a plasma gas inside the chamber to cause such activation and curing of said adhesive;

separating the chamber platens;

restoring the vacuum chamber to atmospheric pressure;

opening the chamber; and

removing the book from the chamber.

4,681,650

POWDER REINFORCING LAMINATE APPARATUS

Robert C. Simmonds, Jr., Boxford; Douglas H. Crowell, Beverly, and John F. Martin, Essex, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Mar. 10, 1986, Ser. No. 838,086
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—378 **5 Claims**

1. A machine for depositing powder in a selected configuration, fusing the configured powder into a laminate and adhering the fused laminate to a shoe substrate comprising

heater assembly means including

heater means for raising the temperature of configured powder to fuse the powder into a laminate, and

a support plate,

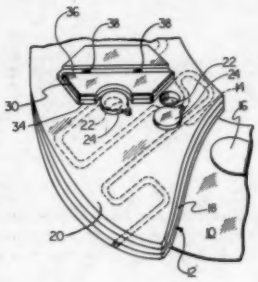
said heater assembly having a pair of radially spaced holes extending downwardly through said heater and support plate through which a fused laminate underlying the holes can be observed,

conveyor means for conveying configured powder past said heater means to fuse the configured powder into a fused laminate,

temperature sensor assembly means including

means for remotely sensing temperature,

means for controlling the displacement of said temperature sensing means from one location whereat the temperature of the fused laminate below one of said holes will be sensed to a second location whereat the temperature of the fused laminate below the other one of said



holes will be sensed so that said temperature sensing means can view the fused laminate below either one of said holes,

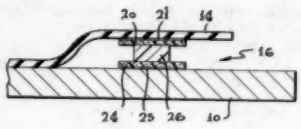
means for selectively covering said holes.

4,681,651

VACUUM BAG SEALING SYSTEM

George R. Brozovic, Glendale; Michael O. Djobadze, LaCrescenta, and Felix M. Navarrete, Arleta, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Aug. 7, 1986, Ser. No. 894,147
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—382 **14 Claims**



1. A sealing system for the forming of structures and the like in a mold comprising:

a base plate for mounting the mold;

a first Teflon coated sealing surface bonded to said base plate extending about said mold;

a vacuum bag;

a second Teflon coated sealing surface bonded to said vacuum bag in a complimentary relationship to said first sealing surface when said vacuum bag is placed over said mold and said base plate; and

adhesive means for detachably sealing said first sealing surface to said second sealing surface so that an airtight seal is formed between said vacuum bag and said base plate.

4,681,652

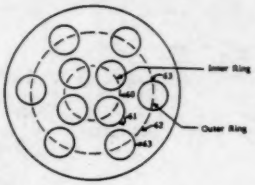
MANUFACTURE OF POLYCRYSTALLINE SILICON

Leo C. Rogers, 1651 W. Lindner, Mesa, Ariz. 85202, and Alfred J. Heitz, 2950 E. Dover, Mesa, Ariz. 85203

Filed Jun. 5, 1980, Ser. No. 156,659
Int. Cl.[4] C30B *25/10*
U.S. Cl. 156—613 **7 Claims**

1. In a process of producing polycrystalline or monocrystalline silicon by thermal decomposition and deposition of a silicon-containing composition upon a plurality of deposition members within a reactor chamber, the improvement which comprises the step of mounting the deposition members in an outer ring 50 and an inner ring surrounded by the outer ring

that the deposition members of the outer ring are positioned so as to intercept and absorb the outward radiation from the inner ring in order to cause the outer ring deposition members to act



as an insulative barrier to the heat from the inner ring's radiation and thus to prevent loss of a substantial amount of heat radiated by the inner ring deposition members.

4,681,653

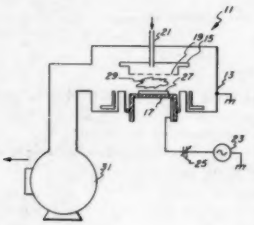
PLANARIZED DIELECTRIC DEPOSITED USING PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION

Andrew J. Purdes, and Gregory C. Smith, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 616,517, Jun. 1, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 837,878

Int. Cl.[4] C30B *25/06*

U.S. Cl. 156—614 **7 Claims**



1. A method of smooth topography deposition of a material onto a substrate, comprising the steps of:

(a) providing a substrate,

(b) providing a mixture of gases which react in a plasma to provide a dielectric material for deposit,

(c) flowing said mixture of gases over said substrate,

(d) exciting said mixture of gases into a plasma over said substrate to deposit said material onto said substrate, and

(e) simultaneously backsputtering a portion of said deposited material to provide a backsputtering rate of said deposited material sufficient to obtain a sidewall slope of no more than about sixty degrees,

(f) wherein said material is silicon dioxide and said gases include silane and nitrous oxide, and

(g) wherein the pressure of said gases is less than 1000 mTorr; said plasma is excited by an RF power density exceeding 0.1 watt per square centimeter; and the ratio of the flow of nitrous oxide to the flow of silane is about ten.

4,681,654

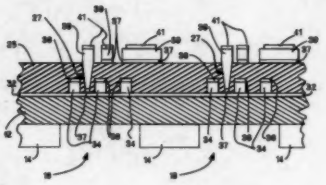
FLEXIBLE FILM SEMICONDUCTOR CHIP CARRIER

Robert J. Clementi, Binghamton; Charles E. Gazdik, Endicott; William Lafer, Chenango Bridge; Roy L. Lovesky, Vestal; Donald G. McBride, Binghamton; Joel V. Munson, Port Crane, and Eugene P. Skarvinko, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1986, Ser. No. 865,316

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **B29C** *37/00;* **C03C** *15/00*

U.S. Cl. 156—630 **19 Claims**



8. A method for making a circuitized flexible film substrate comprising the steps of:

coating one side of a carrier foil with uncured polyimide;

drying the polyimide on the carrier foil to partially cure the polyimide;

coating one side of a tape with an adhesive material, said tape having at least one window-like opening;

laminating the tape together with the carrier foil, with the polyimide coated side of the carrier foil facing the adhesive coated side of the tape;

removing the carrier foil to leave the tape with a relatively thin continuous layer of polyimide spanning the window-like opening in the tape;

fully curing the polyimide on the tape; and

circuitizing the polyimide layer spanning the window-like opening in the tape.

12. The method as recited in claim **8** further comprising the step of:

mounting an electronic device on the circuitry of the polyimide layer spanning the window-like opening in the tape.

4,681,655

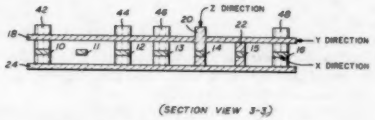
ELECTRICAL INTERCONNECT SUPPORT SYSTEM WITH LOW DIELECTRIC CONSTANT

Curtis N. Potter, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 24, 1986, Ser. No. 934,367

Int. Cl.[4] H01L *21/00*

U.S. Cl. 156—632 **6 Claims**



(SECTION VIEW 3-3)

1. A method of fabricating an anodic aluminum support system for metallic conductors comprising,

providing two or more metal layers, separated by a coating of aluminum, creating a multiple layer electrical interconnect system,

anodizing the aluminum,

applying a resist mask to spaced portions of the top of the system,

applying an etching solution to the top of the system for removing the anodized aluminum except for the portions covered by the mask thereby providing a multilayer con-

ductor system supported by pillars of anodic aluminum surrounded by low dielectric air.

6. A method of fabricating an anodic aluminum support system having an air bridge for metallic conductors comprising,

making a multiple layer interconnect system by depositing a first metal layer extending in the X direction and a second metal layer extending in the Y direction and a third layer extending in the Z direction onto a ground plate each of which layer is separated by a coating of aluminum,

anodizing the aluminum,

applying a photoresist mask to spaced positions of the top of the system,

applying an etching solution to the top of the system for removing all of the anodized aluminum except for the portions covered by the mask thereby providing a multilayer conductor supported by pillars of anodic aluminum surrounded by low dielectric air.

4,681,656

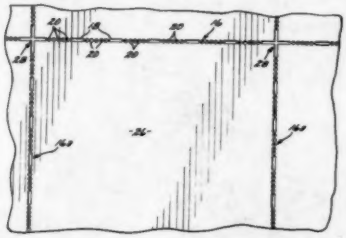
IC CARRIER SYSTEM

James E. Byrum, 1203 Countrywood La., Vista, Calif. 92083

Continuation-in-part of Ser. No. 468,415, Feb. 22, 1983, abandoned. This application May 1, 1985, Ser. No. 729,228

Int. Cl.⁴ C23F *1/02;* **B44C** *1/22;* **B23K** *9/00;* **C25D** *5/02*

U.S. Cl. 156—645 **30 Claims**



1. The method of making a matrix of IC carriers which comprises:

providing a generally flat sheet ceramic blank which has been sintered by means of a primary, high temperature firing;

laser-machining a first plurality of parallel, straightline sequences of elongated, substantially straight-sided slots in said fired ceramic blank; and

laser-machining a second plurality of said sequences in said fired ceramic blank which is orthogonal to and intersecting with said first plurality of sequences;

said IC carriers being defined between adjacent pairs of said first sequences and adjacent pairs of said second sequences.

4,681,657

PREFERENTIAL CHEMICAL ETCH FOR DOPED SILICON

Bao-Tai Hwang, Pougkeepsie; Wendy A. Orr-Arienzo, Chappaqua, both of N.Y., and Reinhard Glang, Reston, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,402

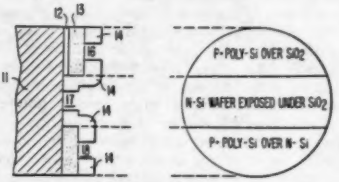
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C23F** *1/02;* **C03C** *15/00*

U.S. Cl. 156—657 **4 Claims**

1. A method for the controllable, preferential patterned etching of a doped silicon layer which overlies an intrinsic or lightly doped crystal surface which comprises the steps of:

providing an etch mask overlying the silicon layer;

immersing the doped silicon on the crystal surface in an etchant solution comprising about 0.2–6 mole percent hydrofluoric acid, 14–28 mole percent nitric acid, and 66–86 mole percent acetic acid/water; and



etching portions of the doped silicon layer exposed through the mask in the solution until the exposed doped silicon is removed and the underlying surface is clear and specular.

4,681,658

TREATED GLASS FIBERS AND NONWOVEN SHEET-LIKE MAT AND METHOD

Ed C. Hsu, Pittsburgh, and Chester S. Temple, McKees Rocks, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 422,617, Sep. 24, 1982, Pat. No. 4,536,446. This application Mar. 29, 1985, Ser. No. 717,755

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.⁴ D21H *5/18*

U.S. Cl. 162—156 **13 Claims**

1. Aqueous dispersion of chopped glass fiber strands having a length of about 1/16 of an inch to about 3 inches and having a chemical treating composition consisting essentially of

a. nonionic surfactant,

b. cationic quaternary ammonium salt surfactant, wherein the ratio of the nonionic or cationic surfactants is about 1 to about 99 to about 99 to 1, and

c. a major amount of water to give an effective total solids content for the composition for treating the glass fibers during their formation,

where the strands are present in an amount of about 0.001 to about 5 weight percent of the dispersion.

4,681,659

MULTI-NIP HIGH PRESSURE PRESS

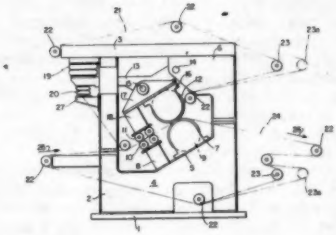
Johann Sbaschnigg, Graz, Austria, assignor to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Continuation-in-part of Ser. No. 541,300, Oct. 12, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,167

Claims priority, application Austria, Oct. 12, 1982, 3756/82

Int. Cl.⁴ B30B *9/24;* **D21F** *3/02;* **F26B** *13/28*

U.S. Cl. 162—360.1 **2 Claims**



1. A device for further dehydration of lengths of material and adapted to be attached as a separate unit to a dehydrating machine such as a double, longitudinal or circular strainer, said device comprising a pair of compression rollers mounted in their own frame through the compression nip of which an

individual lower strainer and/or felt belt is caused to pass together with a length of material discharged from said dehydrating machine, said lower strainer and/or felt belt being separate from said dehydrating machine and abutting the lower one of said pair of compression rollers, each of said compression rollers having substantially the same diameter, at least one pair of rollers immediately preceding said pair of compression rollers, each roller of said at least one pair of rollers having a diameter of about one-fourth the diameter of each of said compression rollers, an upper strainer and/or felt belt separate from said dehydrating machine and abutting the upper one of said pair of compression rollers, wherein said lower strainer and/or felt belt and said upper strainer and/or felt belt are guided ascendingly within the area of said pair of compression rollers and said at least one pair of rollers of lesser diameter with said length of material compressed therebetween, and wherein bearings for said upper compression roller and for the upper one of each of said at least one pair of rollers of lesser diameter are attached to a common, movable supported beam on which a lever pivoted to said frame is articulated.

4,681,660

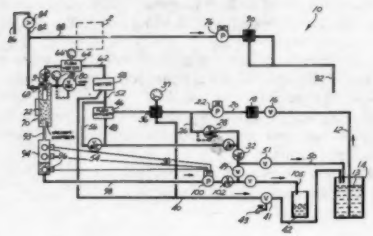
METHOD AND DEVICE FOR RECLAIMING FLUID LUBRICANTS

Rick R. Budny, 2511 Stratford Dr., St. Joseph, Mich. 49085

Continuation-in-part of Ser. No. 634,185, Jul. 26, 1984, abandoned, which is a continuation of Ser. No. 453,346, Dec. 27, 1982, abandoned. This application Jul. 15, 1985, Ser. No. 755,005

Int. Cl.[4] C10G *33/06*

U.S. Cl. 196—46.1 **12 Claims**



1. Apparatus for reclaiming fluid lubricants containing solid and liquid contaminants, said apparatus comprising inlet means for introducing a quantity of contaminated fluid into the apparatus, filtering means positioned adjacent to and in direct flow communication with said inlet means for removing said solid contaminants from said contaminated fluid, heater means serially connected and in flow communication with said filtering means for heating the fluid passed from said filtering means to the heater means to a temperature between 60° C. and 83° C., distillation means serially connected and in flow communication with said heater means for reducing the pressure of the fluid passage from said heater means to the distillation means to produce a purified fluid free of solid and liquid contaminants, and adjustable pump means in flow communication with said distillation means for regulating the pressure within the distillation means to correspond to the boiling point of the fluid passed from the heater means, an outlet conduit serially connected to and located in flow communication with said distillation means, said apparatus including a continuous conduit from said inlet means to said outlet conduit, pump means for propelling said fluid from said inlet means to said distillation means, and pump means in flow communication with said distillation means and said outlet conduit for directing said purified fluid from said distillation means through said outlet conduit, said apparatus further including flow dividing means for said heater means located between and in flow communication with said filtering means and said heater means so as to divert preselected percentage of said filtered fluid into said heater means, said apparatus further including a drain and a receptacle for containing the contaminated fluid, said drain being in flow communication between said flow dividing means and said receptacle, said flow dividing means positioned along said continuous conduit and in flow communiation with said drain so as to divert a remaining percentage of the filtered fluid passing through said flow dividing means to said drain, said drain being in flow communication with said receptacle so that said remaining percentage of filtered fluid may be recycled back into said apparatus.

4,681,661

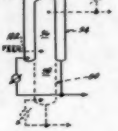
DUAL DISTILLATION COLUMNS

Rakesh Govind, 10409 Stone Ct., Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 541,991, Oct. 14, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 657,731

Int. Cl.[4] B01D *3/26*

U.S. Cl. 202—154 **2 Claims**



1. A distillation apparatus adapted to effect separation of component materials of a first and a second mixture and maintain said mixtures separate comprising a first distillation column comprising:

a first upper rectifying section and a first lower stripping section;

a first feed inlet into said first distillation column between said first rectifying section and said first stripping section;

a first outlet from said first rectifying section;

a second distillation column comprising a second upper rectifying section and a second lower stripping section;

a second feed inlet into said second distillation column between said second upper rectifying section and said second lower stripping section;

a second outlet from said second rectifying upper section;

wherein the first lower stripping section of said first distillation column surrounds and is in thermal contact with said second upper rectifying section of said second distillation column, and first lower stripping section of said first distillation column and said second upper rectifying section of said second distillation column having a common cylindrical wall, said second upper rectifying section having a top wall, said cylindrical wall and said top wall separating said second upper rectifying section from said first lower stripping section thereby permitting said second upper rectifying section of said second column to be maintained at a higher pressure than said first lower stripping section of said first column without a compressor.

4,681,662

HOT COKE BUCKET AND BUCKET CAR ASSEMBLY

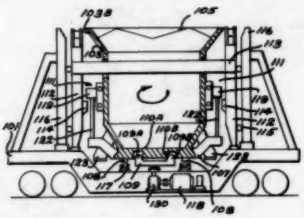
Shoji Kutsumura, Hokkaido, and Touichi Isonaga, Shiga, both of Japan, assignors to Nippon Steel Corp. and Fujicar Manufacturing Co. Ltd., both of Japan

Filed Sep. 24, 1984, Ser. No. 653,768

Claims priority, application Japan, Sep. 26, 1983, 58-148667[U]; Jun. 1, 1984, 59-81779[U]; Jun. 1, 1984, 59-81780[U]; Aug. 17, 1984, 59-171293; Aug. 17, 1984, 59-171294

Int. Cl.[4] C10B *39/02, 39/14*

U.S. Cl. 202—270 3 Claims



1. An assembly of a rotary coke bucket and a bucket car for transporting hot coke to a dry quenching facility comprising:

at least three rollers arranged on an upper surface of the bucket car in a circular configuration;

a rotary arm rotatably mounted on said upper surface of said car with the rotating axis of said arm being identical to the center of the circular configuration of said rollers; said rotary arm having spaced apart ends and having at each said end an upward projection;

driving means for rotating the rotary arm;

said coke bucket having a bottom comprising two gate members forming a discharge gate, said two gates members further each having a bottom surface and a semicircular rail disposed thereon, said rails being engaged by said rollers when said bucket is disposed on said car; and

a plurality of recesses formed on said bottom surface of each of the discharge gate members to loosely engage with said upward projections of the rotary arm when said bucket is disposed on said car.

4,681,663

BIPOLAR ELECTRODE FORMATION

Harvey N. Seiger, Mayfield Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 12, 1986, Ser. No. 941,204

Int. Cl.[4] H01M *10/44*

U.S. Cl. 204—21 44 Claims

1. A system useful in the formation of electrodes for use in electrochemical cells, said system comprising:

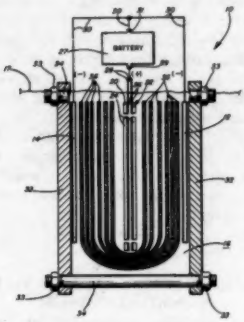
a power supply;

a pair of conductive end electrodes spaced apart from one another and disposed in an aqueous electrolyte during operation of said system, said end electrodes being in electrical contact with said power supply to effect current flow in said electrolyte;

a pair of precursor electrodes each comprising an electroactive material to be reduced or oxidized disposed on a conductive substrate, said precursor electrodes being disposed in said electrolyte in a configuration substantially precluding contact between said electrolyte and said substrates and orientated relative to said end electrodes so as to permit said reduction or oxidation of said material, said substrates being in electrical contact with said power supply to effect current flow in said electrolyte;

restraining means for applying restraining forces to said precursor electrodes substantially maintaining the dimensions of said precursor electrodes during said reduction or oxidation; and,

a separator disposed between said precursor electrodes and said end electrodes permitting said precursor electrodes and said end electrodes to contact said electrolyte and



permitting a substantially uniform application of said restraining forces to said precursor electrodes.

4,681,664

PROCESS FOR PRODUCING PIECES OF JEWELRY FROM PRECIOUS METALS AND PIECES OF JEWELRY PRODUCED BY IT

Rudolf Eberle, Knittlingen; Wilfried Essert, Pforzheim, and Herbert Kull, Neuenbürg, all of Fed. Rep. of Germany, assignors to Juwedor GmbH, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,633

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509791; Dec. 21, 1985, 3545549

Int. Cl.[4] C25D *1/02*

U.S. Cl. 204—9 15 Claims

1. A process for the production of pieces of jewelry made from metal wherein metal is electrodeposited on an electrically conductive mould core having the spatial contour of the piece of jewelry and on reaching the desired coating thickness the material of the mould core is removed from the electrodeposited metal to leave a hollow jewelry body made of said electrodeposited metal, and wherein said hollow jewelry body is thereafter provided with a solid zone made from metal in at least one area of the piece of jewelry which is likely to be thereafter more strongly stressed than other areas of said piece of jewelry.

4,681,665

PROCESS AND APPARATUS FOR ELECTROCHEMICAL TREATMENT OF THE SURFACE OF METAL PRODUCTS OF ELONGATE SHAPE

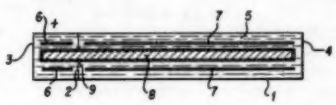
Robert Guillermet, Rives; Michel Ladet, Seyssinet; Gérard Laslaz, and Claude Le Bars, both of Voiron, all of France, assignors to Aluminium Pechiney, Paris, France

Filed Feb. 24, 1984, Ser. No. 583,232

Claims priority, application France, Mar. 16, 1983, 83 04612

Int. Cl.[4] C25D *11/02, 19/00*

U.S. Cl. 204—14.1 5 Claims



1. A process for electrochemical treatment, within an elongated electrochemical cell, of the surface of metal products,

wherein the products are static or in movement along the length of said cell comprising the steps of:

providing an elongated electrochemical treatment cell with a single compartment containing an electrolyte;

providing the cell with a plurality of electrodes positioned along its walls and forming at least four groups;

passing current through the electrodes for developing successively along the length of the cell an anodic group, a non-charged group, a cathodic group, and non-charged group spaced apart from each other;

electrically switching simultaneously said anodic group, said non-charged group, said cathodic group, and said non-charged group successively along the length of the cell at a speed greater than the speed of said product when said product is in motion.

4,681,666

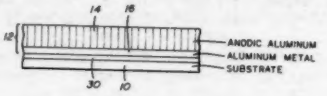
PLANARIZATION OF A LAYER OF METAL AND ANODIC ALUMINUM

Curtis N. Potter, and Harry Kroger, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 13, 1986, Ser. No. 930,167

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **5 Claims**



1. A method of planarization of a layer of metal and anodic aluminum in a multilayered electrical interconnect system comprising,

coating a substrate with aluminum,

anodizing the aluminum from the top towards but not entirely to the bottom leaving a thickness of unanodized aluminum on the bottom,

applying an etch mask to the top of the anodic aluminum leaving a predetermined area bare,

etching out the anodic aluminum in the bare area down to the unanodized aluminum,

plating a metal to the unanodized aluminum in the etched out area, the thickness of the unetched plating being equal to the thickness of the anodic aluminum,

removing the mask, and

anodizing the unanodized aluminum.

4,681,667

METHOD OF PRODUCING ELECTROSTRICTIVE EFFECT ELEMENT

Kazuaki Utsumi; Atsushi Ochi; Masanori Suzuki, and Mitsuhiro Midorikawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 564,652, Dec. 22, 1983, abandoned. This application Dec. 10, 1986, Ser. No. 940,210

Claims priority, application Japan, Dec. 22, 1982, 57-225169; Mar. 24, 1983, 58-49250; Oct. 18, 1983, 58-194901; Oct. 18, 1983, 58-194902; Oct. 18, 1983, 58-194903; Oct. 18, 1983, 58-194904

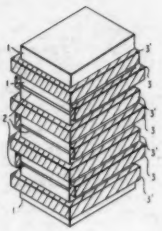
Int. Cl.[4] C25G *7/00*

U.S. Cl. 204—15 **18 Claims**

5. A method of producing an electrostrictive effect element comprising the steps of:

preparing a laminated structure having films or thin plates of electrostrictive material and internal electrodes superposed alternatingly in such manner that their respective principal surfaces are faced to each other, said laminating structure having flat side surfaces perpendicular to said principal surfaces and exposing cross sections of said internal electrodes on said flat side surfaces;

placing said laminated structure having said flat side surfaces in a suspension solution containing glass powder and selectively depositing said glass powder only on said cross sections of every other one of said internal electrodes and portions of the layers of the electrostrictive material therearound exposed on said flat side surfaces by an electrophoretic deposition process with the other portions of said



layer of said electrostrictive material or said flat side surfaces being maintained exposed; and

thereafter sintering said glass powder selectively deposited only on said cross sections of said every other one of said internal electrode layers and said portions of the layers of the electrostrictive material therearound at said flat side surfaces of the laminated structure to form a plurality of separated belts of glass coating films on said flat side surfaces.

4,681,668

ANODIC ALUMINIUM OXIDE FILM AND METHOD OF FORMING IT

Nigel C. Davies, and Peter G. Sheasby, both of Banbury, England, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 31, 1985, Ser. No. 793,742

Claims priority, application United Kingdom, Nov. 5, 1984, 8427943

Int. Cl.[4] C25D *11/08*

U.S. Cl. 204—28 **11 Claims**

1. A method of forming an anodic film on an aluminium strip by continuously passing the strip through a phosphoric-acid-containing electrolyte maintained at a temperature of from 25° to 80° C., the contact time between the strip and the electrolyte being not more than 15 seconds during which time the strip is anodized at the current density of at least 250 A/m^2, the nature, concentration and temperature of the elcectrolyte being chosen in relation to the current density such that the rate of chemical dissolution of the oxide film is comparable to, but less than, the rate of anodic oxide formation, whereby there is formed on the surface of the strip an anodic oxide film from 15 to 200 mm thick and containing phosphate ion.

4,681,669

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIA

Toshiro Takahashi; Tadao Tokushima, both of Hamamatsu; Yoshifumi Suzuki, Iwata, and Yukio Wakui, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 14, 1985, Ser. No. 798,234

Claims priority, application Japan, Nov. 16, 1984, 59-241838

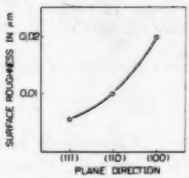
Int. Cl.[4] C25D *11/20*

U.S. Cl. 204—35.1 **1 Claim**

1. Improved method for producing magnetic recording media comprising the steps of

subjecting an Al predominant substrate to anode oxidation to form thereon an Al surface layer with pores,

depositing ferromagnetic substance in said pores of said Al surface layer, and



grinding said Al surface layer,

the surface of said Al predominant substrate having a K-value specified by

$$K = \frac{S(1\,1\,1)}{\Sigma S(h\,k\,l)} \geqq 0.5$$

in which S (1 1 1) is the X-ray reflection intensity by the (1 1 1) crystal plane of Al and ΣS (h k l) is the total X-ray reflection intensity by all crystal planes of Al, both by Miller indices.

4,681,670

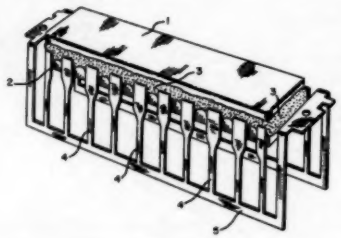
BATH AND PROCESS FOR PLATING TIN-LEAD ALLOYS

Fred I. Nobel, Sands Point, and David N. Schram, Freeport, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 774,822, Sep. 11, 1985, Pat. No. 4,640,746, which is a continuation-in-part of Ser. No. 659,818, Oct. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 423,748, Sep. 27, 1982, abandoned. This application Sep. 4, 1986, Ser. No. 903,528

Int. Cl.[4] C25D *3/32, 3/36, 3/56, 3/60*

U.S. Cl. 204—44.4 **23 Claims**



1. A tin, lead or tin/lead alloy electroplating solution comprising a soluble tin compound, or a soluble divalent lead compound, or both; and a complexing agent of a carboxylic acid, phosphonic acid, or an alkali salt thereof in an amount sufficient to maintain the tin and/or lead compounds in said solution; said solution having a pH in the range of about 1.5 to less than 4.

4,681,671

LOW TEMPERATURE ALUMINA ELECTROLYSIS

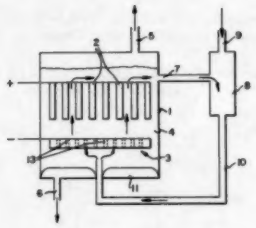
Jean-Jacques Duruz, Geneva, Switzerland, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Feb. 13, 1986, Ser. No. 829,435

Claims priority, application Austria, Feb. 18, 1985, 810063/85

Int. Cl.[4] C25C *3/06, 3/12*

U.S. Cl. 204—67 **20 Claims**



1. A method of producing aluminum by electrolysis of alumina dissolved in a molten fluoride electrolyte in an aluminum reduction cell using a low temperature melt, at a temperature up to 860° C., characterized by effecting a continuing steady-state electrolysis using an oxygen-evolving, non-consumable anode having an electrochemically active surface area at least 1.5 times larger than the projected area of the anode onto a horizontal plane, said electrolysis being effected at an anodic current density which is at or below a threshold value corresponding to the maximum transport rate of oxide ions in the electrolyte and at which oxide ions are discharged preferentially to fluoride ions, the electrolyte circulating between an electrolysis zone wherein the electrolyte is depleted of alumina and an enrichment zone wherein the electrolyte is enriched with alumina.

4,681,672

METHOD FOR ETCHING ELECTRODE FOILS FOR AN ALUMINIUM ELECTROLYTIC CAPACITOR

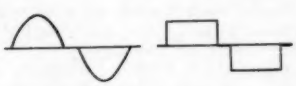
Koichi Kojima; Akihiro Jujo, both of Osaka; Masanori Okabayashi, Kyoto; Ryoichi Shimatani, Kyoto; Kenji Toyama, Kyoto, and Nobuyoshi Kanzaki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 27, 1985, Ser. No. 813,861

Claims priority, application Japan, Dec. 28, 1984, 59-280380

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.4 **2 Claims**



1. A method for electrolytically etching an aluminum foil for use as an electrode of an aluminum electrolytic capacitor, which comprises arranging the aluminum foil between and in parallel to a pair of equally spaced electrodes in a 3 to 25% hydrochloric acid solution containing aluminum chloride at a temperature of from 20 to 60 degrees C., and electrolytically etching the aluminum foil on the surfaces thereof by application of an AC current across the paired electrodes without direct application to the aluminum foil to etch the foil, said AC current having a waveform in which each cycle consists of positive and negative half cycles and an OFF time interval between the half cycles at which the AC current is zero, the current waveforms in the positive and negative half cycles being identical, the interval of each half cycle being in the range of from 10, to 100 msec and each OFF time interval at

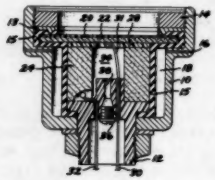
which the etching current is zero being in the range of from 2 to 30 msec, whereby the size of pits formed by the etching may be suitably controlled.

4,681,673

PORTABLE OXYGEN SENSOR WITH SHORTENED BREAK-IN TIME

Leonard W. Niedrach, and Fritz G. Will, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 665,672, Oct. 29, 1984. This application Jun. 23, 1986, Ser. No. 877,612
Int. Cl.[4] G01N *27/46;* B22F *3/12*
U.S. Cl. 204—415 9 Claims



1. A method of forming a preconditioned oxygen sensor cell which comprises
providing a porous body of copper metal having a large surface area for its volume,
distributing through said body of copper a quantity of cuprous oxide to constitute 0.1 to 5.0 percent of the weight of the body of copper,
maintaining a level of porosity of said body of at least 15 percent by volume, and
disposing said porous body in an oxygen sensor cell.

4,681,674

FIXED BED CATALYTIC REACTOR SYSTEM WITH IMPROVED LIQUID DISTRIBUTION

Richard G. Graven, Pennington, and John C. Zahner, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 7, 1985, Ser. No. 795,816
Int. Cl.[4] C10G *65/02*
U.S. Cl. 208—59 6 Claims

1. A continuous process for treating a wax-containing petroleum oil in a multi-phase fixed bed catalytic hydrodewaxing reactor system comprising the steps of
feeding the oil and a reactant gas containing hydrogen at feed flow rates above a first bed of porous zeolite hydrodewaxing catalyst particles under hydrodewaxing conversion conditions for concurrent downward flow therethrough;
collecting and withdrawing the treated oil from the first bed and redistributing at least a portion of the treated oil to at least one succeeding catalyst bed of porous zeolite hydrodewaxing catalyst particles while permitting the gaseous phase to flow directly to the succeeding catalyst bed;
recycling a quantity of treated oil collected below a catalyst bed and reapplying the treated oil at a preceding redistribution zone above the bed from which treated oil is collected, whereby the total of oil feed flow rate and recycled treated oil flow rate is maintained at sufficient liquid flux rate to effect substantially uniform catalyst wetting, thereby enhancing hydrodewaxing conversion.

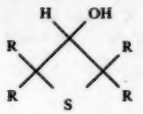
4,681,675

ORE FLOTATION

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 722,627, Apr. 12, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,732
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—167 15 Claims

1. A process for recovering metal values selected from the group consisting of:
molybdenum and
copper,
from particulate solids containing said metal values in the presence of at least one sulfide selected from the group consisting of:
iron,
nickel,
lead, and
zinc,
which process comprises:
(a) mixing said solids with water, a collector and a 3-hydroxytrimethylene sulfide of the formula:



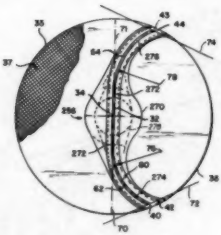
wherein each R is independently H or C_1–C_3 alkyl radical, to establish a pulp;
(b) aerating said pulp to produce a froth containing a first portion of said minerals while allowing a second portion of said minerals to be depressed in said pulp; and
(c) recovering said first portion of said minerals from said froth.

4,681,676

ANALYTIC SIEVING APPARATUS

Alfred J. Heidinger, Chester, and Robert W. Duyckinck, New Providence, both of N.J., assignors to Mikropul Corporation, Summit, N.J.

Filed Mar. 28, 1985, Ser. No. 716,987
Int. Cl.[4] B07B *1/55*
U.S. Cl. 209—380 3 Claims



1. In a dry particulate sieving device of the type having
a circular first chamber adapted to receive and contain particulate material having a range of particle sizes extending above and below a predetermined particle size;
a horizontally disposed planar screen serving as the floor of said first chamber and having a plurality of openings therein sized to pass particles having a size below said predetermined particle size therethrough;
a second circular chamber disposed below said first chamber

adapted to receive particles passing through said screen; and

a rotor assembly having a horizontally disposed upper surface positioned closely adjacent the undersurface of said planar screen adapted to direct an air jet curtain against the undersurface of and through said screen;

the improvement wherein the upper surface of said rotor assembly includes an elongate and generally C shaped slot having a substantially diametrically disposed center portion and a pair of arcuately bowed end portions disposed in facing relation and compositely traversing said screen undersurface for emitting a complementally C shaped jet curtain against the undersurface of said screen during rotation thereof.

4,681,677

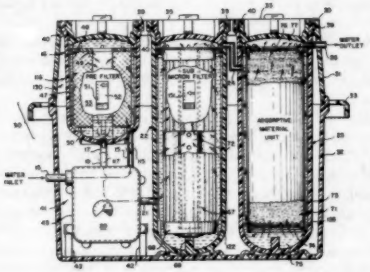
WATER PROCESSOR HAVING AUTOMATIC SHUTOFF AND BYPASS MEANS

Louis M. Kuh, and Robert C. Lampe, both of Stamford, Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 326,963, Dec. 2, 1981, abandoned, which is a continuation of Ser. No. 167,169, Jul. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 39,936, May 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 879,027, Feb. 17, 1978, abandoned. This application Aug. 5, 1985, Ser. No. 762,816

Int. Cl.[4] B01D *27/10*

U.S. Cl. 210—88 **16 Claims**



1. A fail-safe water processor for in-line installation between a source of water supply and a point of use in a water distribution system, said fail-safe water processor comprising:

a housing having inlet means and outlet means adapted to be connected to a water distribution system so that water flowing through the water distribution system passes through said fail-safe water processor;

replaceable mechanical filter means and replaceable adsorption means within said housing in serial fluid communication with one another and with said inlet and outlet means said mechanical filter means causing a water pressure drop in water flowing through said water distribution means between said inlet means and said replaceable adsorption means across said mechanical filter means;

water metering means within said housing normally in fluid communication with said inlet means and with said replaceable adsorption means, said water metering means being actuated directly by water flowing through said fail-safe water processor regardless of the duration of flow so as to cumulatively total the quantity of water that has flowed through said water metering means to said replaceable adsorption means;

shutoff valve means operatively connected to said water metering means to stop water flowing to said replaceable adsorption means after a predetermined quantity of water has passed through said water metering means, said predetermined quantity of water being generally equal to the maximum safe quantity which can safely be treated by said replaceable adsorption means;

first indicator means associated with said water metering means for continuously indicating what portion of the functional life of said replaceable adsorption means has been exhausted and when said replaceable adsorption means is at the end of its functional life and should be replaced;

flow interruption means operatively associated with said replaceable mechanical filter means for measuring the pressure drop of water pressure across said replaceable mechanical filter means and for interrupting water flowing through said replaceable mechanical filter means when a predetermined water pressure differential, indicating the depletion of said replaceable mechanical filter means, exists across said replaceable mechanical filter means; and

second indicator means associated with said replaceable mechanical filter means and said flow interruption means for indicating when the flow interruption means has interrupted the water flowing through said replaceable mechanical filter means and said replaceable mechanical filter means should be replaced.

4,681,678

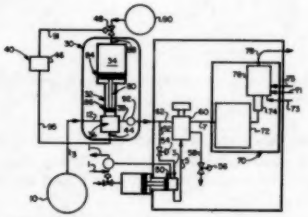
SAMPLE DILUTION SYSTEM FOR SUPERCRITICAL FLUID CHROMATOGRAPHY

Emory J. Leaseburge, and Kenneth J. Melda, both of Lewisburg, W. Va., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 10, 1986, Ser. No. 917,628

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—101 **1 Claim**



1. An apparatus for analyzing a process stream via supercritical fluid chromatography comprising:

a. chromatograph means for analyzing a sample of the process stream diluted in a volume of the supercritical fluid via supercritical fluid chromatography;

b. pump means for drawing a supercritical fluid substance from a container means through a supply line, pressurizing said supercritical fluid substance and delivering said pressurized supercritical fluid substance to said chromatograph means; and

c. extraction means operatively associated with said chromatograph means for drawing a known sample volume from the process and injecting said volume into a known volume of supercritical fluid substance to form a dilute mix for analysis, said extraction means comprising a pneumatically driven syringe pump having a first larger diameter chamber adapted to receive pressurized air, a second smaller diameter chamber adapted to receive supercritical fluid substance from said pump means, and an axially extending plunger having a first large diameter head disposed and axially translatable in sealing relationship within the first chamber and a second small diameter head disposed and axially translatable in sealing relationship within the second chamber, and a sample capture valve for drawing a sample of known volume from the process stream and transferring said sample to the second smaller

diameter chamber to diffuse in the supercritical fluid substance to form said dilute mix.

4,681,679

FILTERING DEVICE FOR SEPARATING SOLIDS FROM LIQUIDS

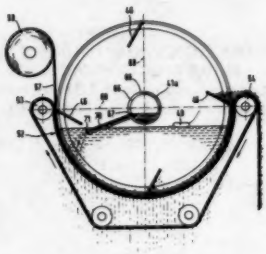
Hans Reber, Wartburgstrasse 5, D-7410 Reutlingen-Sickenhausen, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,272

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409826

Int. Cl.[4] B01D *33/04, 33/14*

U.S. Cl. 210—107 **6 Claims**



1. A filtering device for separating solids from liquids by a gravity filtration process, comprising

a housing;

two circular discs spaced from each other in coaxial arrangement and rotatably mounted in said housing with a horizontally oriented axis of rotation, each of said discs having a peripheral flange;

a delivery spool rotatably mounted on said housing with an axis of rotation parallel to said axis of rotation of said discs;

a filter belt having a pair of space-apart edges, an end supported by said delivery spool, and a portion unwrapped from said delivery spool;

a plurality of guide pulleys rotatably mounted in said housing with axes of rotation parallel to said axis of rotation of said discs;

an endless screen support belt having parallel spaced-apart edges arranged and adapted to be guided by said guide pulleys to form an upper strand and a lower strand;

drive means for driving said endless screen support belt;

said upper strand of said endless screen support belt supporting said unwrapped portion of said filter belt and pressing said spaced-apart edges of said filter belt against said peripheral flanges of said discs over an arcuate angle of at least 120 degrees, forming with said two discs a half drum-like filter chamber that is open upwards;

said lower strand of said endless screen support belt returning through the filtered liquid;

sludge catch bars mounted on said discs to rotate with said discs, extending from and between said discs and arranged to contact said filter belt in said filter chamber;

a conduit for charging an unfiltered liquid mixture into said filter chamber; and

a float switch disposed in the area of said filter chamber for detecting the liquid level therein.

4,681,680

DEVICE FOR THE SELECTIVE AND CONTINUOUS RECOVERY OF HYDROCARBONS PRESENT IN THE FORM OF A SHEET AT THE SURFACE OF AN AQUEOUS MEDIUM

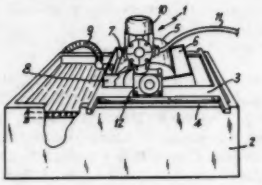
Luc Delons, Pau, and Roger Chaumont, Condrieu, both of France, assignors to Elf France, Paris, France

Filed Jun. 10, 1983, Ser. No. 503,048

Claims priority, application France, Jun. 11, 1982, 82 10231

Int. Cl.[4] B01D *17/12*

U.S. Cl. 210—110 **14 Claims**



1. In a device for the selective and continuous recovery of hydrocarbons present in the form of a sheet on the surface of a liquid medium, an extraction means comprising:

a roller mounted for rotation within a housing and about a horizontal axis, and having a surface comprised of a hydrophobic and oleophilic material and disposed within said housing so that lower portions of the roller surface are capable of being brought into contact with the hydrocarbons to be recovered;

recuperator means operatively associated with upper portions of the roller surface to recover hydrocarbons adhered to the hydrophobic and oleophilic material of said surface;

a recipient for attracting said sheet to the surface of said roller and for creating an accumulation zone of hydrocarbons which are maintained at a substantially continuous level, comprising a first, inclined face having an axis parallel to the generatrix of said roller and a free upper edge, and a second face connected to the lower edge of said first face, wherein said first face and said second face combine with parallel flanges to define a volume which is upwardly open and which surrounds at least the lower portions of said roller; and

means for evacuating said liquid medium from said volume, operatively associated with lowermost portions of said recipient;

wherein the recipient is mounted for rotation about a horizontal axis between a high position, and a low position in which the upper edge of said first face is immersed at a depth such that the input of liquid entering the recipient is equal to the sum of the rate of extraction by said roller and the rate of evacuation by said evacuation means.

4,681,681

GROOVED FILTER DISCS

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Jun. 22, 1984, Ser. No. 623,353

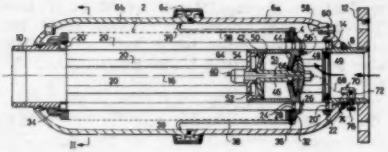
Claims priority, application Israel, Jul. 1, 1983, 69145

Int. Cl.[4] B01D *29/46*

U.S. Cl. 210—133 **15 Claims**

1. A filter comprising a housing having an inlet and an outlet, and a filter body disposed within said housing for filtering the fluid flowing therethrough from the inlet to the outlet, characterized in that said filter body includes a plurality of grooved filter discs supported in a stack on a plurality of individual rods extending longitudinally of the housing, said rods being supported at their opposite ends by said housing and being disposed in an array around the housing longitudinal axis with spaces between the rods to provide large passageways for the flow of the fluid; each of said grooved filter discs being formed

with an opening of a diameter at least as large as the outer diameter of said array of rods for supporting said discs in stack form on said array of rods; the inner faces of said housing at the opposite sides of the filter body being formed with recesses defining individual sockets each of a configuration corresponding to the ends of said rods; the opposite ends of said rods being seated within said sockets.



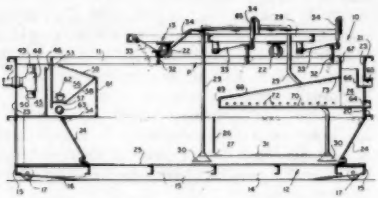
8. A filter comprising a housing having an inlet and an outlet, and a filter body including a plurality of grooved filter discs supported in stacked relation within said housing, characterized in that said housing further includes a stack-removing member disposed at one end of said stack of filter discs, and a handle secured to said stack-removing member to facilitate drawing the filter discs out of the filter housing, when opened for cleaning purposes, without breaking the stack.

4,681,682

AIR FLOTATION CLARIFIER

Harold R. White, New Lenox, and Alex J. Doncer, Palos Heights, both of Ill., assignors to Alar Engineering Corporation, Mokena, Ill.

Filed Jul. 26, 1983, Ser. No. 517,504
Int. Cl.[4] B03D *1/24*
U.S. Cl. 210—221.2 **12 Claims**



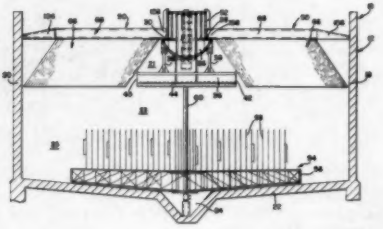
1. A clarifier comprising an elongated settling tank for a pond of liquid having an inlet at one end, an outlet at the other end, and an overflow trough intermediate said ends, suction means for removing sludge from the bottom of the tank, skimmers for pushing floating scum on a pond when in the tank into said trough, a pressure tank, a compressed air source discharging to the top of said pressure tank, an air-liquid mixer discharging to said pressure tank, a compressor receiving air from the top of said pressure tank discharging to said mixer, means feeding effluent from the outlet of said settling tank to said mixer, means feeding air saturated effluent from said pressure tank to the inlet end of said settling tank, and means projecting into said settling tank from the outlet end thereof for removing clarified liquid as it is formed in the settling tank.

4,681,683

LAMELLA GRAVITY SEPARATOR

Anders Lindstol, deceased, late of Oakville, Canada (by Eva Lindstol, administratrix), assignor to Ecodyne Limited, Oakville, Canada

Filed Sep. 9, 1986, Ser. No. 905,703
Claims priority, application Canada, Oct. 9, 1985, 494171
Int. Cl.[4] B01D *17/028*
U.S. Cl. 210—521 **11 Claims**



1. Apparatus for separation of solids suspended in a liquid, comprising:

(a) a liquid receiving basin;

(b) a plurality of plate packs positioned within said basin, said plate packs including a plurality of inclined parallel plates therein defining a plurality of parallel inclined flow passages therebetween;

(c) an inlet distribution means for directing liquid to be treated into said basin and upwardly through said flow passages;

(d) an elongated collector trough means secured to each of said plate packs in covering relationship to the upper portions thereof, said collector trough means having a floor and upstanding sidewalls, said floor having means defining a plurality of orifices formed therein in communication with said flow passages for directing clarified liquid upwardly therethrough into said collector trough means;

(e) an elongated outlet trough means extending transversely with respect to said collector trough means for receiving clarified liquid from said collector trough means and directing same from said basin wherein said collector trough means has an outlet opening formed therein in fluid communication with said outlet trough means ; and

(f) said collector trough means having first end portions releasably secured to a sidewall of said basin and second end portions releasably secured to said outlet trough means such that each collector trough means and corresponding plate pack may be individually removed from said basin.

4,681,684

UNIVERSAL SEPTIC TANK FITTING

Michael D. Maroschak, Casselberry; Frederick P. Atchley, Tallahassee, and Douglas G. Everson, Winter Springs, all of Fla., assignors to Plastic Tubing Industries, Inc., Orlando, Fla.

Filed Apr. 29, 1985, Ser. No. 728,362
Int. Cl.[4] B01D *21/24*
U.S. Cl. 210—532.2 **14 Claims**

1. A universal septic tank fitting useful as either an inlet sweep or an outlet tee, said fitting comprising:

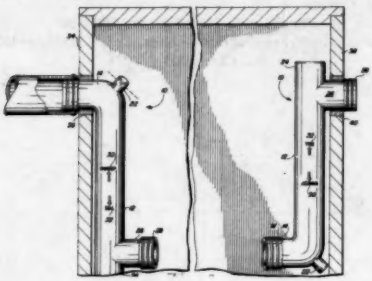
a generally tubular member having a central axis;

a first tube extending into said tubular member adjacent a first end thereof generally radial to said central axis, said first tube having an open end;

a second tube extending into said tubular member adjacent a second end thereof and generally radial to said central axis, but in a radial direction generally different from the

radial direction of said first tube, said second tube having an open end;

first vent means adjacent said first end of said tubular member;



second vent means adjacent said second end of said tubular member; and

means for closing one of said first and second vent means.

4,681,685

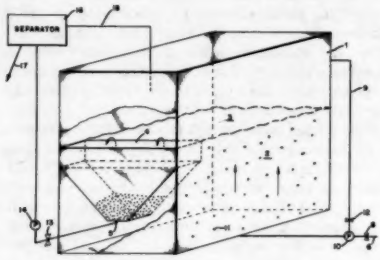
METHOD AND APPARATUS FOR CONCENTRATING BIOPARTICLES

Paul M. Sutton, Bethel, Conn., and Joseph Peplinski, Coldwater, Canada, assignors to Dorr-Oliver Inc., Stamford, Conn.

Filed Jun. 25, 1985, Ser. No. 748,519

Int. Cl.⁴ C02F 3/08

U.S. Cl. 210—618 **14 Claims**



1. A method for controlling biomass growth in a reactor comprising:

concentrating a portion of bioparticles in said reactor by means of at least one concentrator positioned within said reactor and disposed on the inside wall of said reactor such that an opening of said concentrator is positioned substantially at a point near the maximum preferred height of the fluidized bed in said reactor said bioparticles being a media with biomass adhered thereto; and

removing the concentrated bioparticles from said concentrator to a separating means for separation of said concentrated bioparticles into media and biomass.

7. A system for controlling biomass growth comprising:

a reactor comprising feed material, bioparticles for fluidizing and treating said feed material, said bioparticles being media with said biomass adhered thereto, and at least one concentrator positioned within said reactor and disposed on the inside wall of said reactor such that an opening of said concentrator is positioned substantially at a point near the maximum preferred height of the fluidized bed in said reactor for concentrating said bioparticles; and

a separator in communication with said concentrator for removing concentrated bioparticles from said concentrator and separating said concentrated bioparticles into media and biomass.

4,681,686

COTELOMER COMPOUNDS

Norman Richardson, 21 Grey Street, Middleton, Manchester, M24 3UF, England; Brian Holt, 70 Moss Park Road, Stretford, Manchester, M32 9HQ, England, and Barry Cook, 11 Warwick Drive, Urmston, Manchester, M31 2AY, England

Continuation-in-part of Ser. No. 691,083, Jan. 14, 1985, abandoned. This application Jul. 10, 1985, Ser. No. 753,510

Claims priority, application United Kingdom, Jan. 13, 1984, 8400848

Int. Cl.⁴ C02F 5/14

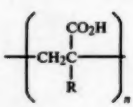
U.S. Cl. 210—699 **25 Claims**

1. A cotelomer compound having the formula

(I)

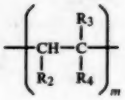
and salts thereof wherein

A is a random polymeric residue comprising at least one unit of formula II



(II)

and at least one unit of formula III, different from a unit of formula II,



(III)

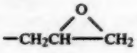
and B is hydrogen or a residue A; wherein m and n are integers such that the sum of m+n is an integer of from 3 to 100, the ratio of n:m being from 99 to 1:1 to 99, provided that the resulting telomers are water-soluble and wherein m, n or m and n in a residue A are the same or different from m, n or m and n in a residue B;

R is hydrogen, methyl or ethyl;

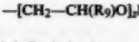
R_1 is a residue —OX, wherein X is hydrogen, an alkali metal, an alkaline earth metal, ammonium or an amine residue;

R_2 is hydrogen, methyl or a residue —$COOR_5$ wherein R_5 is hydrogen or a straight or branched chain alkyl having 1 to 8 carbon atoms;

R_3 is hydrogen, a straight or branched chain alkyl having 1 to 4 carbon atoms, hydroxymethyl or —$COOR_6$ wherein R_6 is hydrogen, a residue of the formula



or a residue of the formula



in which R_9 is hydrogen, methyl or phenyl and z is an integer from 1 to 20, or R_6 is a straight or branched chain alkyl having 1 to 8 carbon atoms or said alkyl substituted by —SO_3M or by

—COOM where M is hydrogen or an alkali metal or alkaline earth metal atom;

R_4 is —$COOR_6$ where R_6 is as defined above, or R_4 is a straight or branched alkyl having 1 to 8 carbon atoms or said alkyl substituted by one to three carboxylic acid groups; or R_4 is phenyl or said phenyl substituted by —SO_3M or by —PO_3M_2; or R_4 is acetoxy, hydroxymethyl, acetoxymethyl, —SO_3M, —CH_2SO_3M, —PO_3M_2 or —$PO_3M'_2$ in which M is hydrogen or an alkali metal or alkaline earth metal atom and M' is M or alkyl of 1 to 4 carbon atoms; or R_4 is a residue —$CONR_7R_8$ wherein R_7 and R_8 are the same or different and each is hydrogen, straight or branched chain alkyl having 1 to 8 carbon atoms, hydroxymethyl, —CH(OH)-COOM, —$C(CH_3)_2CH_2SO_3M$, —$C(CH_3)_2CH_2PO_3M_2$ or —$N(R_{10})COCH_3$ in which R_{10} is hydrogen or straight or branched chain alkyl of 1 to 4 carbon atoms,

with the proviso that, when R_2 and R_3 are each hydrogen, then R_4 is other than —$COOR_6$ in which R_6 is —$CH_2CH(R_9)OH$ where R_9 is hydrogen or methyl.

4,681,687

USE OF ALKALI METAL NITRITES TO INHIBIT H_2S FORMATION IN FLUE GAS DESULFURIZATION SYSTEM SLUDGES

Richard J. Mouché, Batavia, and Peter Song, Midlothian, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 20, 1986, Ser. No. 920,476
Int. Cl.[4] C02F 1/50
U.S. Cl. 210—764 **3 Claims**

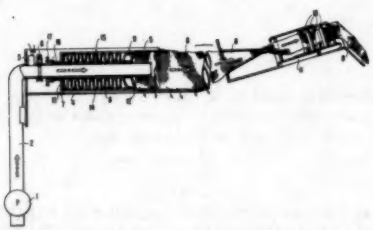
1. A method for controlling the growth of sulfate-reducing bacteria including Desulfovibrio desulfricans and odors including H_2S produced thereby in flue gas desulfurization scrubber sludges which comprises treating these sludges with a biocidal and odor controlling dosage of an alkali metal nitrite in an amount of at least about 50 ppm, to control the growth of said sulfate reducing bacteria and prevent the biogenic production of said H_2S.

4,681,688

TUBULAR TRASH NET FOR PRE-TREATING SEWAGE, WITH REPLACEABLE NET CASSETTE

Sten Y. Sondov, and Jan O. From, both of Oslo, Norway, assignors to Interpublic a.s, Oslo, Norway

PCT No. PCT/N085/00030, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05616, PCT Pub. Date Dec. 19, 1985
PCT Filed May 31, 1985, Ser. No. 827,965
Claims priority, application Norway, Jun. 1, 1984, 842200
Int. Cl.[4] B01D 33/00; C02F 11/12
U.S. Cl. 210—770 **11 Claims**



1. A method for separating, transporting and dewatering coarse solid particles suspended in water comprising the steps of:

leading the water through a large-mesh submerged tubular net having an active screening section,

trapping a substantial number of said coarse solid particles in said net,

drawing the net forward with its trapped coarse solid particles up above the surface of the water which has passed through the net at a speed which is regulated by a system of rotating rollers above the water surface to provide new and unrestricted screening area,

said active screening section being located between a replaceable storage cassette from which the large-mesh net is drawn out and the point where the net with its trapped coarse solid particles is pulled up above the water surface the rollers simultaneously transporting the net with its contents and dewatering the net and its contents by pressure,

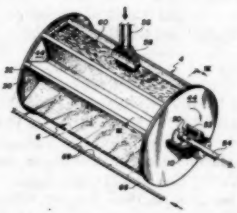
disposing the net and its contents, and replacing the nearly empty storage cassette with a new storage cassette containing a tubular net.

4,681,689

V-SHAPED TROUGH FILTERS, ROTARY ASSEMBLIES THEREOF AND METHODS OF FILTERING THEREWITH

Forrest B. Stannard, Inverness, and Edward J. Highstreet, Crystal River, both of Fla., assignors to The Dehydro Corporation, Charlotte, N.C.

Filed Feb. 26, 1986, Ser. No. 833,002
Int. Cl.[4] B01D 33/08
U.S. Cl. 210—784 **8 Claims**



1. A rotary filter device comprising: means designed to mitigate problems in the filtration of sewage sludge or similar liquid suspensions prone to form filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration in conventional filtration units, said device being formed of a plurality of filter units,

each said unit including

a pair of rigid, porous sheets formed of granular material fixed in a cured resin matrix,

said sheets each having a substantially flat front side and a substantially flat back side

said sheets being spaced apart with their front sides defining therebetween a V-shaped trough having a closed apical portion and an opposed open portion, and

a web closing each end of said trough,

said filter units being fixed in a cylindrical assembly with the back sides of adjacent units facing one another with a space therebetween and with said apical portion of each unit positioned around a common center,

means to apply a vacuum to the back side of each of said sheets, and

means to rotate said cylindrical assembly about said common center.

5. A filtration method comprising: mitigating problems encountered in filtering sewage sludge or similar liquid suspensions prone to form filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration in conventional filtration methods by,

providing a rotary filter device formned of a plurality of filter units,

each said unit comprising:

a pair of rigid, porous sheets formed of granular material fixed in a cured resin matrix,

said sheets each having a substantially flat front side and a substantially flat back side

said sheets being spaced apart with their front sides defining therebetween a V-shaped trough having a closed apical portion and an opposed open portion, and

an impervious web sealing each end of said trough,

said filter units being fixed in a cylindrical assembly with the back sides of adjacent units facing one another with a space therebetween and with said apical portion of each unit positioned around a common center,

means to apply a vacuum to the back side of each of said sheets, and

means to rotate said cylindrical assembly about said common center as a horizontal axis

rotating said device about said horizontal axis at a predetermined rate sufficient that each said unit therein passes seriatim through a first quadrant wherein said unit will attain an uppermost position of rotation, a second quadrant, a third quadrant wherein said unit will attain a lowermost position of rotation and a fourth quadrant,

charging a liquid suspension to be filtered into a V-shaped trough positioned in said first quadrant,

applying vacuum to a back side of said V-shaped trough in its passage through at least one of said first and second quadrants,

discharging filter cake from said V-shaped trough in its passage through said second or third quadrant, and

cleaning said V-shaped trough in its passage through at least one of said third and fourth quadrants.

4,681,690

STABILIZED FRACTURING FLUID AND METHOD OF STABILIZING FRACTURING FLUID

Shoichi Kanda, Kanagawa; Makoto Yanagita, Tokyo, and Yukihiko Sekimoto, Saitama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

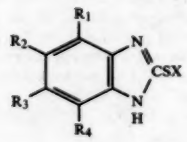
Filed Jan. 16, 1986, Ser. No. 819,329

Claims priority, application Japan, Jan. 16, 1985, 60-4011

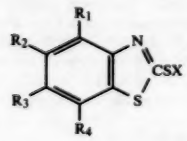
Int. Cl.[4] E21B *43/26*

U.S. Cl. 252—8.551 **10 Claims**

1. A method of stabilizing an aqueous fracturing fluid containing at least one polymer selected from the group consisting of (1) guar gum and (2) at least one derivative of guar gum selected from the group consisting of hydroxypropylguar, hydroxyethylguar and carboxymethylguar, wherein the said at least one polymer is present in an amount effective to aid in preventing the reduction of rheological properties of the fracturing fluid, which comprises adding at least one stabilizing compound selected from 2-mercaptobenzimidazole and 2-mercaptobenzothiazole compounds to the fracturing fluid, wherein the 2-mercaptobenzimidazole and 2-mercaptobenzothiazole compounds are represented by formulae (1) and (2) respectively:



(1)



(2)

wherein R_1, R_2, R_3, and R_4, each represents a hydrogen atom or a lower alkyl group, and X is a hydrogen atom, an alkali metal atom, or an ammonium group.

4,681,691

MOLDABLE COMPOSITION

Harold S. Schriver, Jr., York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,418

Int. Cl.[4] F16C *33/12*

U.S. Cl. 252—12 **17 Claims**

1. A moldable composition for use in making bulk deformable sealing members for articles comprised of:

a mixture of

a. a major amount of an elastomeric material;

b. an amount of filler material at least 30 parts per hundred by weight of said elastomeric material;

c. an amount of a catalyst sufficient to polymerize said elastomeric material; and

d. an amount of oil of between 2.5 and 20 parts per hundred by weight of elastomeric material, said oil being incompatible with said elastomeric material;

said moldable composition when molded yielding a test member having a Shore A hardness of between 30 and 95, preferably between 50–65 when measured in accordance with ASTM D-2240, whereby

after molding a sealing member from said mixture, said incompatible oil blooms to surface portions of said sealing member resulting in said surface portions of said sealing member having inherent lubricity.

4,681,692

MULTIFUNCTIONAL LUBRICANT/FUEL ADDITIVES AND COMPOSITIONS THEREOF

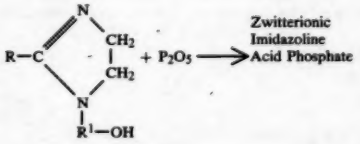
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,196

Int. Cl.[4] C10M *129/00, 137/00*

U.S. Cl. 252—32.5 **17 Claims**

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor friction reducing or antiwear proportion of an imidazoline derived internal acid phosphate prepared by reacting a hydrocarbyl imidazoline in the following generalized reaction with phosphorus pentoxide:



where R is about C_6 to about C_{30} hydrocarbyl or hydrocarbyl substituted with oxygen or sulfur and/or nitrogen and R^1 is C_1 to about C_6 hydrocarbyl.

4,681,693

STABILIZERS WITH ARYLPHOSPHINIC STRUCTURE FOR PERFLUORO-POLYETHER OILS AND GREASES

Piero Gavezotti, Milan, and Ezio Strepparola, Treviglio, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

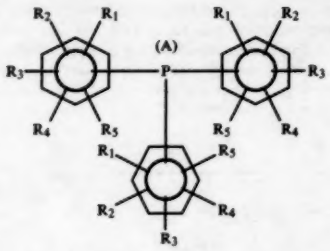
Filed Apr. 23, 1986, Ser. No. 854,786

Claims priority, application Italy, Apr. 24, 1986, 20475 A/85

Int. Cl.[4] C10M *137/14*

U.S. Cl. 252—49.9 **10 Claims**

1. An arylphosphine selected from the group consisting of arylphosphines of the formula:



(I)

wherein A, when present, can be either oxygen or sulphur, R_1, R_2, R_3, R_4, R_5, equal to, or different from each other, are —H, —F, $—CF_3$ or —B—R_{f1}; with the constraint that at least one of the R_1–R_5 groups on at least one of benzene rings is a —B—R_{f1} radical, wherein R_{f1} is:

(a) $Z—CF_2O(C_3F_6O)_m(CFXO)_n—CFY—$, wherein

X=—F or $—CF_3$;

Y=—F or $—CF_3$;

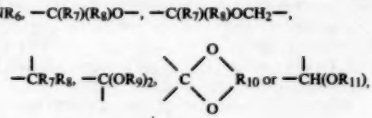
Z=—F, $—CF_3$ or $—CF_2—CF_3$; in the latter case n=0 and Y=$—CF_3$;

m and n are integers, with m being comprised between 1 and 30 and n being comprised between 0 and 10, and the molecular weight of R_{f1} is comprised within the range of from 135 to 6500 and the (C_3F_6O) and (CFXO) units are randomly distributed along the chain;

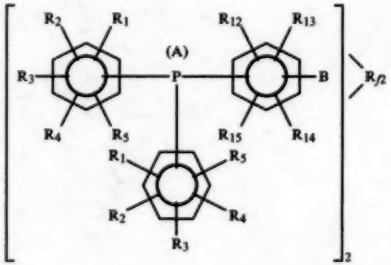
(b) $X—(CF_2CF_2CW_2O)_p—$

wherein Z has the meaning described above, W is H or F and p is an integer from 1 to 30; or

(c) D—$(CF_2CF_2O)_q$— wherein d is $—CF_3$ or $—C_2F_5$, q is an integer from 1 to 30;



wherein R_6, R_7, R_8, R_9 and R_{11} are alkyl radicals containing from 1 to 3 carbon atoms, R_6, R_7 and R_8 can be also hydrogen; R_{10} is an alkylene radical of from 1 to 3 carbon atoms; and



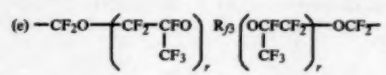
wherein R_1, R_2, R_3, R_4, R_5, R_{12}, R_{13}, R_{14} and R_{15}, equal to or different from each other are —H, —F, $—CF_3$ or —B—R_{f1};

A, B, R_{f1} have the same meaning as above;

R_{f2} is:

(d) $—CF_2O(C_2F_4O)_p(CF_2O)_q—CF_2—$;

wherein p and q are integers different from zero, and the p/q ratio ranges from 0.5 to 2, preferably from 0.5 to 1.5, the average molecular weight being comprised within the range of from 300 to 7000;



wherein r is an integer from 1 to 20 and R_{f3} is a perfluoroalkylenic radical;

(f) $—CF_2O—(CF_2CF_2CF_2O)_tR_{f3}(OCH_2CF_2CF_2)_t—OCF_2—$,

wherein R_{f3} has the meaning described hereinabove and t is an integer from 1 to 20;

(g) $—CF_2O—(—CF_2CF_2CF_2O—)_sCF_2—$,

wherein s is an integer from 1 to 30; or

(h) $—CF_2O—(—CF_2CF_2O—)_s—CF_2—$,

wherein s has the meaning described herein above.

4,681,694

MARINE CRANKCASE LUBRICANT

Benjamin H. Zoleski, Beacon, N.Y.; Wheeler C. Crawford, Houston, Tex., and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.

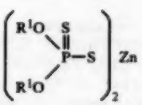
Filed Dec. 23, 1985, Ser. No. 812,156

Int. Cl.[4] C10M *133/54, 133/04*

U.S. Cl. 252—51.5 R **9 Claims**

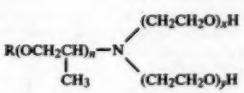
1. A crankcase lubricating oil composition having a Total Base Number ranging from about 3 to about 10 and comprising:

(a) major portion of a mineral lubricating oil containing from about 1 to about 5 wt.% of at least one overbased salt selected from the group consisting of calcium alkylphenolate or a sulfurized calcium alkylphenolate having a TBN of about 147 and mixtures thereof, from about 0.1 to about 1.0 wt.% of a zinc dithiophosphate



wherein R^1 is a $(C_3$–$C_{12})$ hydrocarbyl radical or a hydroxy substituted $(C_3$–$C_{12})$ hydrocarbyl radical, and from about 0.5 to about 3.0 wt.% of dinonyldiphenylamine; and

(b) from about 0.1 to about 5.0 to about 1 wt.% of as, a rust-inhibiting additive, a dialkoxylated alkylpolyoxyalkyl tertiary amine



wherein R is a $(C_1$–$C_{30})$ alkyl, n is an integer of about 1 to about 6, and x+y is about 2 to about 30 where both x and y cannot be equal to 0.

4,681,695

BLEACH COMPOSITIONS

Michael Divo, Euskirchen, Fed. Rep. of Germany, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 28, 1985, Ser. No. 770,540

Claims priority, application United Kingdom, Sep. 1, 1984, 8422158

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—94 **25 Claims**

1. A bleach activator composition in the form of spray-dried granules having an inner core consisting essentially of from

0.1% to about 50% water-soluble organic peroxyacid bleach precursor and a surface coating comprising from about 10% to about 99.9% of water-soluble or water-dispersible, inorganic hydratable material, and wherein the composition has a pH as a 1% aqueous solution in the range of from about 3 to about 7.

4,681,696

SOLID STABILIZED ACTIVE HALOGEN-CONTAINING DETERGENT COMPOSITIONS AND METHODS

Anthony J. Bruegge, Cincinnati, and Denny E. Daughtery, West Chester, both of Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 622,199, Jun. 19, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,405

Int. Cl.[4] C11D *3/10, 7/56;* **C01B** *11/06*

U.S. Cl. 252—99 **9 Claims**

1. A method of stabilizing an active efficient halogen source selected from the group consisting of water soluble hypochlorites, halogenated hydantoins, halogenated phosphates, chlorinated isocyanuric acids and salts thereof, comprising mixing free water, one or more sulfonamides selected from the group consisting of water soluble alkyl sulfonamides and water soluble aryl sulfonamides and an active efficient halogen source to form a solution of sulfonamide and halogen source and combining said solution with one or more hydratable detergent builders in an amount effective to form solid detergent,

wherein said sulfonamide includes a sulfonamide radical defined by the following formula:

wherein x and y are selected from the group consisting of H, halogen, alkyl, and an alkali or alkaline earth metal ion and at least x or y is H or a metal ion.

4,681,697

PROCESS FOR PRODUCING SOLID ALUMINUM CHLORIDE COMPOSITIONS

Werner Doetsch, Bad Hoenningen, and Rudolf Siegel, Neuwied, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 854,492

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515341

Int. Cl.[4] C02F *1/52, 5/02*

U.S. Cl. 252—175 **7 Claims**

1. A process for producing a solid, cold-water soluble, sulfate containing aluminum chloride composition comprising the steps of introducing in aqueous solution or aqueous suspension form alkali aluminate, sulfuric acid, hydrochloric acid and hydrated aluminum oxide into a spray drier, and recovering the resulting solid material.

4,681,698

ELECTROCHEMICAL CELLS HAVING A GELLED ANODE-ELECTROLYTE MIXTURE

Teresita O. Graham, Dobbs Ferry, and John T. Goodman, Croton-on-Hudson, both of N.Y., assignors to Duracell Inc., Bethel, Conn.

Division of Ser. No. 106,996, Dec. 26, 1979, Pat. No. 4,455,358. This application Jul. 28, 1980, Ser. No. 173,941

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—182.1 **7 Claims**

1. A method for improving the discharge characteristics of an electrochemical cell having a cathode, a powdered metal anode and an aqueous alkaline electrolyte solution comprising the step of gelling an intimate mixture of the powdered metal anode and electrolyte solution with an agent, said agent comprising a material capable of absorbing water and having a carbohydrate backbone and water soluble, ionized side chain grafted thereon; said carbohydrate backbone and side chain being in molar ratios of from 1:1 to 1:19; and said side chain being selected from the group consisting of acrylonitrile, acrylamide, acrylic acid, methyl methacrylate, acrylic acid ester, vinylacetate, N-vinyl-2-pyrrolidone, salts of alginic acid, gluconic acid, and mixtures thereof.

4,681,699

BISAZO DYES AND THEIR USE IN LIQUID CRYSTALLINE MATERIALS

Karl-Heinz Etzbach, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

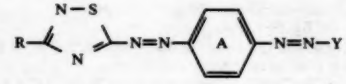
Filed Sep. 16, 1985, Ser. No. 776,461

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433927

Int. Cl.[4] C09K *19/00*

U.S. Cl. 252—299.1 **8 Claims**

1. A liquid crystal composition, comprising a bisazo dye which contains a 1,2,4-thiadizole ring, said bisazo dye being of the formula I:

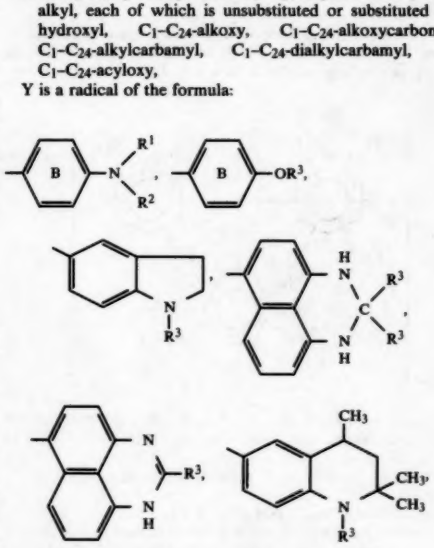


wherein:

R is hydrogen, or phenyl, phenylmethyl, phenylethyl, phenoxy, phenoxymethyl, phenoxyethyl, phenylmethylthio, or phenylethylthio radical, wherein the said radicals are either unsubstituted or substituted by C_1–C_{24}-alkyl, C_1–C_{24}-alkoxy, C_1–C_{24}-alkoxycarbonyl, C_1–C_{24}-acyloxy, C_5–C_7-cycloalkyl, 4-(C_1–C_{12}-alkylcyclohexyl), phenyl, chlorine or bromine, or

R is C_5–C_7-cycloalkyl or a C_1–C_{24}-alkylthio or C_1–C_{24}-alkyl, each of which is unsubstituted or substituted by hydroxyl, C_1–C_{24}-alkoxy, C_1–C_{24}-alkoxycarbonyl, C_1–C_{24}-alkylcarbamyl, C_1–C_{24}-dialkylcarbamyl, or C_1–C_{24}-acyloxy,

Y is a radical of the formula:



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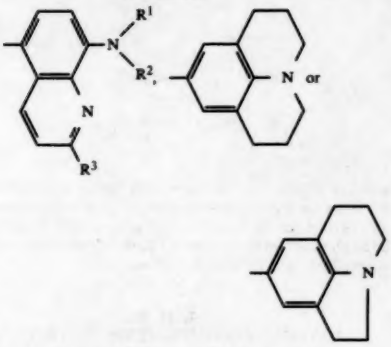


ring A is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy, ethoxy, acetylamino, propionylamino, or ring A is fused to a benzene ring,

ring B is unsubstituted or substituted by chlorine, bromine, methyl, ethyl, methoxy, ethyoxy, acetylamino, propionylamino, or ring B is fused to a benzene ring;

R_1 and R_2 are each independently hydrogen, unsubstituted C_1–C_{24} alkyl, C_1–C_{24} alkyl substituted by cyano, hydroxy, acetoxy, or butyryloxy substituent, cyclohexyl, 2-phenylethyl, unsubstituted benzyl, benzyl substituted by C_1–C_{24}-alkyl, cyclohexyl or C_1–C_{12}-alkyl-cyclohexyl substituent, allyl, or together with the nitrogen atom R_1 and R_2 form a piperidino, pyrrolidino or morpholino radical; and,

R_3 is hydrogen, C_1–C_{24}-alkyl, or cyclohexyl.

4,681,700

PARTIAL OXIDATION OF UPGRADED PETROLEUM COKE

Stephen R. Vasconcellos, Langhorn, Pa.; Mitri S. Najjar, Hopewell Junction, and Ralph Garcia, Wallkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1985, Ser. No. 727,968

Int. Cl.[4] C10J 3/46

U.S. Cl. 252—373 **6 Claims**

1. In a process for the partial oxidation of particulate petroleum coke substantially comprising carbon and containing a small amount of ash comprising vanadium constituents and other materials to produce in a gas generating zone a raw gaseous stream comprising hydrogen and carbon monoxide and containing entrained unconverted particulate petroleum coke comprising carbon and vanadium containing ash, and said gaseous stream is cooled and scrubbed with water in gas cooling and scrubbing zones to produce a cooled and scrubbed clean gas stream and an aqueous dispersion of vanadium containing unconverted particulate petroleum coke; the improvement comprising:

(1) mixing said aqueous dispersion of vanadium containing unconverted particulate petroleum coke having a solids concentration in the range of about 0.5 to 20.0 weight percent and a particle size in the range of about 38 microns and below to less than about 1700 microns with about 0.10 to 0.50 weight percent (basis weight of said aqueous dispersion of unreacted petroleum coke) of a vanadium collection agent to selectively separate a vanadium enriched unconverted petroleum coke fraction from a vanadium-decreased unconverted petroleum coke fraction, and about 0.5 to 5.0 weight percent of a frothing agent to produce froth; wherein said collection agent has the structural formula ROH where R is a straight chain or branched acyclic saturated alkanol having 4 to 8 carbon atoms with the hydroxyl group on the C_2 or C_3 carbon atom and a methyl or ethyl group on anyone of the carbon atoms C_2 to C_7: wherein said frothing agent is selected from the group consisting of cresylic acid, pine oil, polypropylene glycol, and mixtures thereof; and adjusting the pH of said mixture to a value in the range of about 3 to 10, providing the mixture is not already at said pH;

(2) aerating the mixed aqueous dispersion from (1) in a froth flotation zone with a gaseous material from the group consisting of air, nitrogen, carbon monoxide, steam gaseous mixtures of H_2O and CO, and mixtures thereof, and with or without mechanical agitation forming a layer of froth which floats on a bottom layer of aqueous dispersion, wherein;

(a) said aeration is continued until no more solid particles are visible in the foam and from about 70 to 95 weight percent of the unconverted particulate petroleum coke particles (basis carbon) have floated off in the froth, and said unconverted particulate petroleum coke substantially comprises carbon and also contains a small amount of ash with a decreased amount of vanadium constituents;

(b) the remainder of the unconverted particulate petroleum coke is suspended in the bottom layer of aqueous dispersion and substantially comprises carbon and also contains a small amount of ash with an increased amount of vanadium constituents;

(c) where in comparison with the vanadium content of the ash in the unconverted particulate petroleum coke prior to the froth flotation treatment the vanadium content of the ash in the floated portion of unconverted particulate petroleum coke has been decreased about 40 to 80 weight percent and the vanadium content of the ash in the unconverted particulate petroleum coke in the bottom aqueous dispersion has been increased about 20 to 60 weight percent;

(3) concentrating the froth layer from (2) (a) in a solids-liquid separation zone to produce a concentrated aqueous slurry of unconverted particulate petroleum coke with a decreased amount of vanadium constituents and having a solids concentration in the range of about 10 to 70 weight percent, and said concentrated aqueous slurry is mixed with either, (1) dry fresh particulate petroleum coke substantially comprising carbon and a small amount of ash comprising vanadium constituents, or (2) slurries of said fresh particulate petroleum coke in water or in a liquid hydrocarbon fuel or mixtures thereof;

(4) recycling to said partial oxidation gas generating zone at least a portion of the slurry from (3); and

(5) concentrating the bottom layer of aqueous dispersion from (2) (b) in a solids-liquid separation zone to produce water and a concentrated aqueous slurry of unconverted particulate petroleum coke with an increased amount of vanadium constituents and having a solids concentration in the range of about 10 to 70 weight percent or alternatively 100 weight percent solids, and said concentrated aqueous slurry or alternatively 100% solids is sent to a vanadium recovery zone while the separated water is recycled to the gas cooling and scrubbing zones.

4,681,701

PROCESS FOR PRODUCING SYNTHESIS GAS

Swan T. Sie, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,553

Claims priority, application United Kingdom, Aug. 30, 1985, 8521608

Int. Cl.[4] C01B 3/34

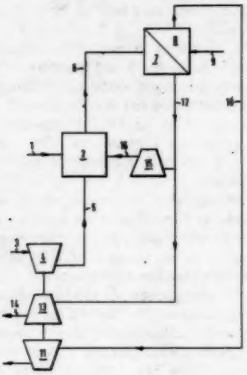
U.S. Cl. 252—373 **4 Claims**

1. A process for producing synthesis gas by reforming hydrocarbons with steam in a reforming reaction zone equipped with heat exchange means which comprises:

(a) passing an oxygen-containing gas to a compression zone wherein said oxygen-containing gas is compressed and passed to a combustion zone;

(b) combusting said compressed gas with a fuel in said combustion zone to form a hot combustion gas effluent stream;

(c) passing said hot combustion gas effluent stream to a reforming zone wherein a hydrocarbon feed stream is reformed during which heat exchange takes place between said hot combustion gas effluent stream and said reformer zone to produce a synthesis gas withdrawn from said reformer zone and to form a reformer zone heat exchanged combustion gas;



(d) passing at least a portion of said heat exchanged combustion gas to a turbo-expander and generating power which is used to compress said oxygen-containing gas in step (a); and

(e) compressing at least another portion of said heat exchanged combustion gas and recycling said compressed heat exchanged combustion gas to said combustion zone of step (b).

4,681,702

SINTERED, ELECTRICAL CONTACT MATERIAL FOR LOW VOLTAGE POWER SWITCHING

Horst Schreiner, and Bernhard Rothkegel, both of Nuremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 577,750, Feb. 7, 1984, abandoned. This application May 16, 1986, Ser. No. 865,932

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1983, 3304637

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—518 **3 Claims**

1. In sintered contact material for low voltage electrical power switchgear consisting of $AgSnO_2$ and two other metal oxide additives, the improvement consisting of Bi_2O_3, and CuO provided as the other metal oxides, and wherein the total metal oxide content is between 15 and 20 percent by volume with the SnO_2 share of at least 80 percent by volume of the total amount of oxide.

4,681,703

ALKYL SUBSTITUTED-2,3-DIHYDROFURAN FRAGRANCE COMPOSITIONS

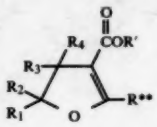
Eugene G. Harris, West Chester, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 726,220, Apr. 23, 1985, Pat. No. 4,636,571, which is a continuation-in-part of Ser. No. 503,974, Jun. 13, 1983, Pat. No. 4,515,978. This application Jun. 4, 1986, Ser. No. 870,594

Int. Cl.[4] A01K *7/46*

U.S. Cl. 252—522 R **28 Claims**

1. A fragrance composition having incorporated therein an odiferous amount of a 2,3-dihydrofuran compound of the formula



wherein R' is an alkyl group having from 1 to 4 carbon atoms, R** is an alkyl group having from 1 to 5 carbon atoms, R_1 is an alkyl group having from 1 to 4 carbon atoms, R_2 is hydrogen or an alkyl group having from 1 to 6 carbon atoms, and R_3 and R_4 are hydrogen or a methyl group.

4,681,704

DETERGENT COMPOSITION CONTAINING SEMI-POLAR NONIONIC DETERGENT ALKALINE EARTH METAL ANIONIC DETERGENT AND AMINO ALKYLBETAINE DETERGENT

Lowell W. Bernardino; Edward W. Kuhl; Mark H. K. Mao, and Eugene J. Pancheri, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 761,661, Jul. 31, 1985, abandoned, which is a continuation of Ser. No. 591,097, Mar. 19, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,828

Int. Cl.[4] C11D *1/29, 1/75, 1/90, 1/94*

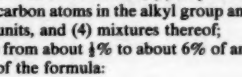
U.S. Cl. 252—546 **17 Claims**

1. A detergent composition especially effective in removing greasy soils wherein the organic detergent portion of said composition consists essentially of a mixture of:

(a) from about ½% to about 6% of a semi-polar organic nonionic detergent comprising water-soluble amine oxides having one alkyl or hydroxy alkyl moiety of 8 to 28 carbon atoms and two alkyl moieties selected from the group consisting of alkyl groups and hydroxy alkyl groups of 1 to 3 carbon atoms;

(b) from about 10% to about 50% of an alkaline earth metal salt of an anionic detergent selected from the group consisting of (1) linear alkyl benzene sulfonates having 9 to 15 carbon atoms in the alkyl group, (2) alkyl sulfates having 8 to 22 carbon atoms, (3) alkyl ether sulfates having 8 to 22 carbon atoms in the alkyl group and 1 to 30 ethylene oxide units, and (4) mixtures thereof;

(c) from about ½% to about 6% of an acylamidoalkylbetaine of the formula:



wherein R is an alkyl group containing from about 7 to about 21 carbon atoms, R^1 is hydrogen or an alkyl group containing from 1 to about 6 carbon atoms, R^2 is an alkylene group containing from 1 to about 10 carbon atoms, each R^3 is an alkyl or hydroxy group containing from 1 to about 6 carbon atoms or an ethoxylated hydroxy group containing from about 1 to about 10 ethylene oxide units, and R^4 is an alkylene group containing from 1 to about 6 carbon atoms.

4,681,705

DECONTAMINATION OF RADIOACTIVELY CONTAMINATED LIQUIDS

Carlton E. Robertson, Wilmington, N.C., assignor to Carolina Power & Light Company, Raleigh, N.C.

Filed Oct. 15, 1985, Ser. No. 787,501

Int. Cl.[4] G21F *9/08;* **C02F** *1/42;* **C09K** *3/00*

U.S. Cl. 252—631 **26 Claims**

1. A method of decontaminating mixtures of radioactively

contaminated water and radioactively contaminated water-immiscible organic liquids to produce a decontaminated organic liquid which can be disposed of in a conventional manner, said method comprising:

(a) separating a discontinuous mixture of radioactively contaminated water and a radioactively contaminated water-immiscible organic liquid in which the organic liquid comprises a continuous phase into a waste water fraction carrying metal radionuclides and an organic liquid fraction carrying metal radionuclides;

(b) decontaminating said waste water fraction;

(c) mixing said radioactively contaminated organic liquid fraction with a sufficient amount of an aqueous solution of a water-soluble chelating agent until water-soluble metal-chelate complexes form between said chelating agent and substantially all of said metal radionuclides carried by said organic liquid fraction;

(d) separating said aqueous solution from said organic liquid fraction thereby removing said water-soluble metal-chelate complexes containing substantially all of the radionuclides from said organic liquid fraction, making said organic liquid substantially free of radionuclides and safely disposable by conventional methods; and

(e) decontaminating said aqueous solution.

4,681,706

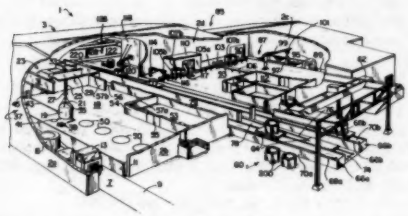
NUCLEAR WASTE PACKAGING FACILITY

Charles W. Mallory, Severna Park, Md.; Ralph E. Watts, Library; Joseph B. Paladino, Pittsburgh, both of Pa.; John E. Razor, Morehead, Ky.; Arthur W. Lilley, Finleyville; Steven J. Winston, New Stanton, both of Pa., and Billy C. Stricklin, Oak Ridge, Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1984, Ser. No. 627,964

Int. Cl.[4] G21F *7/06;* **B25J** *21/00;* **B65B** *3/04, 63/02*

U.S. Cl. 252—633 **18 Claims**



1. A nuclear waste packaging facility comprising:

(a) a first section substantially surrounded by radiation shielding, including means for remotely handling waste delivered to said first section and for placing the waste into a disposal module;

(b) a second section substantially surrounded by radiation shielding, including means for handling a deformable container bearing waste that is delivered to said second section, said handling means including a compactor and means for placing the waste bearing deformable container into said compactor, said compactor capable of applying a compacting force to the waste bearing containers sufficient to inelastically deform the waste and container, and means for delivering the deformed waste bearing containers to a disposal module

(c) a module transportation and loading section disposed between said first and second sections including a transport means and means for handling empty modules delivered to said facility and for loading the empty modules on said transport means, said transport means moving empty disposal modules to said first section and empty disposal modules to said second section for locating empty modules in a position for loading with nuclear waste, and

(d) a grouting station comprising means for pouring grout into the waste bearing disposal module, and a capping station comprising means for placing a lid onto the waste bearing grout-filled disposal module to completely encapsulate the waste.

4,681,707

PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACID ESTERS AND/OR CARBOXYLIC ACIDS

Howard Alper, Ottawa, Canada; Bertrand Despeyroux, Hanau, Fed. Rep. of Germany; David J. H. Smith, Camberley, United Kingdom, and James B. Woell, Ottawa, Canada, assignors to The British Petroleum Company p.l.c., London, England

PCT No. PCT/GB83/00240, § 371 Date Apr. 23, 1984, § 102(e) Date Apr. 23, 1984, PCT Pub. No. WO84/01376, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 28, 1983, Ser. No. 606,812

Claims priority, application United Kingdom, Sep. 30, 1982, 8227972; Feb. 24, 1983, 8305182

Int. Cl.[4] C07C *67/38*

U.S. Cl. 260—410.9 R **11 Claims**

1. A process for the production from an olefinically unsaturated hydrocarbon of a branched-chain saturated carboxylic acid ester and/or the corresponding carboxylic acid wherein the number of ester or carboxylic acid groups is equal to the number of olefinic double bonds in the olefinically unsaturated hydrocarbon which process comprises reacting the olefinically unsaturated hydrocarbon with carbon monoxide and either alcohol or water respectively in the presence of oxygen,

of an added protonic acid selected from the group consisting of hydrochloric acid, sulphuric acid and an organic acid, and

as catalyst (a) palladium, and (b) copper, the component (a) being in the form of an elemental metal or a compound thereof, and the component (b) being in the form of a compound thereof.

6. A process for the production of an unsaturated carboxylic acid di-ester and/or the corresponding dicarboxylic acid which process comprises reacting an acetylenically unsaturated hydrocarbon with carbon monoxide and either alcohol or water respectively in the presence of oxygen,

a protonic acid selected from the group consisting of hydrochloric acid, sulphuric acid, and an organic acid, and

as catalyst (a) palladium, and (b) copper, the component (a) being in the form of elemental metal or a compound thereof, and the component (b) being in the form of a compound thereof.

4,681,708

PROCESS FOR CONVERTING AN ALKOXYALKADIENE TO AN ALKYL DIALKOXYALKANOATE

Biau-Hung Chang, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 3, 1986, Ser. No. 914,906

Int. Cl.[4] C07C *67/37, 67/38*

U.S. Cl. 260—410.9 **18 Claims**

1. A process for forming an alkyl dialkoxyalkanoate comprising contacting an alkoxyalkadiene with an alkanol and carbon monoxide in the presence of a catalytically effective amount of a cobalt catalyst.

4,681,709

ALKYL 9-ALKOXY-7-NONENOATES

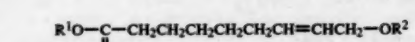
Biau-Hung Chang, West Chester, and Ronnie M. Hanes, Milford, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 3, 1986, Ser. No. 914,903

Int. Cl.[4] C07C *69/533*

U.S. Cl. 260—410.9 **4 Claims**

1. A compound having the structural formula



where R^1 and R^2 are the same or different and are C_1–C_6 alkyl.

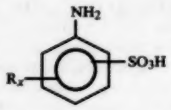
4,681,710

PRODUCTION OF SULFONATED AMINES

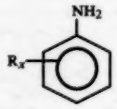
Ralph Miller, Pleasantville, N.Y.; Jakob L. Bollini, and Robert Schneider, both of Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 22, 1985, Ser. No. 714,769
Int. Cl.[4] C07C *143/58*
U.S. Cl. 260—508 **10 Claims**

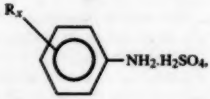
1. In the method for the production of sulfonated aromatic amines of the formula:



where R is H, CH_3, C_2H_5, or halogen; and x is the integer 0 to 2; wherein the aromatic amine of the formula



is treated with concentrated sulfuric acid to form the aromatic amine sulfate at the amine group of the formula



which is then heated to eliminate a mole of water with a rearrangement of the thus formed sulfonate group to the position para or ortho to the restored amine group; the improvement which comprises continuously adding the aromatic amine and concentrated sulfuric acid reactants and mixtures thereof unto and into an indirectly heated, rolling, cascading bed of the preformed, desired, sulfonated, aromatic amine, said bed being maintained above the rearrangement temperature for said sulfonated amine, to eliminate the water from the amine sulfate and to direct the rearrangement of the dehydrated sulfate to the desired sulfonate orientation by the crystalline matrix of the final product comprising said cascading bed and continuously withdrawing the desired sulfonated amine.

4,681,711

METHOD AND APPARATUS FOR AERATION OF WASTEWATER LAGOONS

John M. Eaton, P.O. Box 666, Safford, Ariz. 85548

Filed May 6, 1986, Ser. No. 860,332
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—91 **15 Claims**

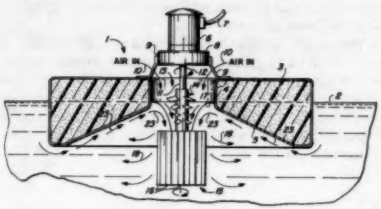
1. A method for aerating wastewater in a lagoon, comprising the steps of:

(a) supporting an impeller by a shaft driven by an electric motor supported on a float floating on the wastewater in the lagoon, the impeller including a plurality of vertical vanes extending symmetrically and radially outward from a hub receiving the shaft, so that the impeller is submerged a predetermined distance below the surface of the lagoon;

(b) rotating the impeller to certrifugally impel wastewater outwardly between vanes of the impeller creating vacuum regions between the vanes and creating a vortex around the shaft from the surface of the lagoon to a top portion of the impeller;

(c) drawing air along the shaft through the vortex into the vacuum regions;

(d) moving wastewater into the vacuum region along with the air, and selecting the rotation rate of the impeller, the predetermined distance, and the height and width of the vanes to cause the upper edges of the vanes to effectively



shear incoming air and incoming wastewater so as to produce sufficient turbulence of air and wastewater between the vanes to entrain millions of minute air bubbles into the wastewater between the vanes to produce a mixture thereof; the height of the vanes being approximately 13 inches, and

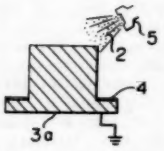
(e) impelling the mixture centrifugally outwardly from the impeller to produce an outward flow of the mixture creating a zone of influence of about 90 feet around the impeller, wherein a large proportion of the millions of minute air bubbles remain entrained in the wastewater lagoon long enough to dissolve about five pounds of oxygen per horsepower per hour into the wastewater.

4,681,712

MOLDING PROCESS FOR PLASTICS

Takao Sakakibara, Kasugai; Tsunehiko Toyoda, Yokohama, and Yoshihisa Nagashima, Hiratsuka, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Tokai Kogyo Co., Ltd., Aichi, both of, Japan

Filed Oct. 30, 1985, Ser. No. 792,841
Claims priority, application Japan, Nov. 5, 1984, 59-233003
Int. Cl.[4] B29C *41/08*; B29B *9/12*
U.S. Cl. 264—24 **14 Claims**



1. A molding process for producing a molded plastic product with a resin coating layer formed on its surface, which comprises electrostatically coating an electrically conductive powdery resin composition on the inner surface of a mold, filling and molding a plastic material in the mold to form a molded plastic product, and plasticizing, under compression, said electrically conductive powdery resin composition by the heat of the filled plastic material and/or by the heat for molding the filled plastic material, to form an electrically conductive resin coating layer securely bonded to the surface of the molded plastic product by anchor effect, wherein the electri-

cally conductive powdery resin composition is a thermoplastic or thermosetting powdery resin composition containing from 70 to 95% by weight of an electrically conductive fine powder, and having a particle size of from 0.5 to 100 μm.

4,681,713

METHOD OF MAKING A HOLLOW FIBER MEMBRANE FOR DIALYSIS

Morio Miyagi; Makoto Ohno, both of Otsu, and Masaru Kanaizumi, Shiga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Division of Ser. No. 596,974, Apr. 5, 1984, Pat. No. 4,587,168. This application Nov. 15, 1985, Ser. No. 798,491

Claims priority, application Japan, Mar. 15, 1984, 59-50362

Int. Cl.[4] B29C *27/60*

U.S. Cl. 264—41 **2 Claims**

1. A method for producing a hollow fiber membrane of a cellulose ester useful for dialysis of body liquids, such as blood, which has a membrane thickness of less than 20μ but not less than 5μ, having a suitable ultra filtration rate retention, and a yield strength S_b (g/filament) after heat-treatment at 80° C. for 20 hours satisfying the following formula (I):

$$0.90 \leqq S_b/S_a \leqq 1.10 \quad (I)$$

wherein S_a represents the yield strength (g/filament) of the hollow fiber membrane measured before heat treatment, which comprises the steps of: extruding a spinning solution of a cellulose ester having a concentration of the cellulose ester of 27 to 37% by weight through cyclic slits around an inner tube of a spinneret having a double tube structure, while extruding simultaneously a core solution through the inner tube of the spinneret; passing the spinning solution extruded from the cyclic slits through a gaseous atmosphere; entering the same into an aqueous coagulation bath having a water content of 65 to 90% by weight; washing the coagulated hollow fibers with hot water of 40° to 80°; passing through a glycerin bath having a glycerin concentration of 25 to 60% by weight and a temperature of glycerin of 35° to 80°; drying with hot air of 60° to 80°; reeling up onto a bobbin; and heat-treating the reeled fibers under a humidity of 10 to 20 g-H_2O/kg-dry air and a dry-bulb temperature of 60° to 100°.

4,681,714

MULTIPLE RELEASE MOLD COATING

William J. Lopes, Midland, and Jerome M. Klosowski, Monitor Township, Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 27, 1985, Ser. No. 813,886

Int. Cl.[4] B29C *33/64, 67/20*

U.S. Cl. 264—46.6 **11 Claims**

1. A method for making molded articles which comprises coating at least one shape determining face of a mold with a composition comprising;

(I) polydimethylsiloxane of the formula

$$Y[Si(Me)_2-O-]_kH$$

where Y is a methyl or hydroxyl radical with at least 80% of all Y being hydroxyl, and k has an average value of at least about 25;

(II) alkyltriacetoxysilane where the alkyl group is methyl, ethyl, or propyl, and;

(III) a nonreactive organic solvent, and (I) is present in about 5 to 20 parts by weight, (II) is present in about 1 to 20 parts by weight, and (III) is present in at least about equal parts by weight of the total weight of (I) and (II) combined, and the ratio of (II) to (I) by weight is at least 0.2;

curing said composition

placing molding material in the mold;

converting the molding material into a molded article; and

removing the molded article from the mold.

10. A method for making molded articles which comprises coating at least one shape determining face of a mold with a composition comprising;

(I) a mixture of a high molecular weight polydimethylsiloxane and a low molecular weight polydimethylsiloxane, both of the formula

$$Y[Si(Me)_2-O-]_kH$$

where Y is a methyl or hydroxyl radical with at least 80% of all Y being hydroxyl, the low molecular weight polydimethylsiloxane (A) has a value of k between 25 and 80, the high molecular weight polydimethylsiloxane (B) has an average value of k between about 300 and 1000, and the weight ratio of (A) to (B) is less than 0.5;

(II) alkyltriacetoxysilane where the alkyl group is methyl, ethyl, or propyl, and;

(III) a nonreactive organic solvent,

(IV) a condensation catalyst which decreases the time required to cure the composition in the presence of water; and (I) is present in about 5 to 20 parts by weight, (II) is present in about 1 to 20 parts by weight, and (III) is present in at least about equal parts by weight of the total weight of (I) and (II) combined;

curing said composition;

placing molding material in the mold; and,

removing the molded article from the mold.

4,681,715

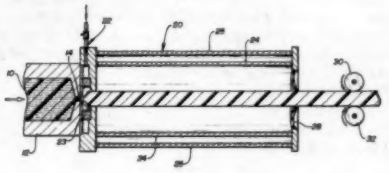
STEAM EXPANDABLE POLYMERIC COMPOSITION AND METHOD

Chung P. Park, Pickerington, and Gerald A. Garcia, Newark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 672,001, Nov. 16, 1984. This application Sep. 20, 1985, Ser. No. 777,992

Int. Cl.[4] C08V *9/14*

U.S. Cl. 264—53 **13 Claims**



1. A process for the preparation of an expanded polymeric foam comprising the steps of:

(a) melt processing under pressure an alkenyl aromatic polymer having a glass transition temperature of between about 60° C. to about 100° C. together with a volatile blowing agent to form a flowable admixture, said volatile blowing agent comprising a mixture of from about 40 to about 90% by weight of a primary blowing agent comprising dichlorodifluoromethane, and from about 10 to about 60% by weight of a secondary blowing agent comprising a halogenated hydrocarbon, a hydrocarbon, or an aliphatic alcohol containing from 1 to 4 carbon atoms, said halogenated hydrocarbon, hydrocarbon or aliphatic alcohol having a normal atmospheric boiling point of from about 0° to about 100° C.,

(b) extruding said admixture through a die to a zone of lower pressure and activating said blowing agent to expand said alkenyl aromatic polymer to a cellular structure, and

(c) exposing said cellular structure to steam at substantially atmospheric pressure to expand further said cellular structure to a foam of lower density.

4,681,716

PROCESS FOR THE PREPARATION OF POLYBENZIMIDAZOLE FOAMS

John S. Letinski, Metuchen, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,812
Int. Cl.[4] B29D *7/01*
U.S. Cl. 264—53 **18 Claims**

1. A process for the production of polybenzimidazole foamed articles comprising:

(a) forming a solvent solution of a polybenzimidazole polymer wherein the inherent viscosity of the polybenzimidazole polymer is in the range of about 0.25 to 0.7;

(b) casting a film from the solvent solution;

(c) removing sufficient solvent from the polymer such that the film contains from about 10 to about 30 percent by weight of the solvent; and

(d) heating the polymer in the temperature range of about 350° C. to about 600° C. to form a foamed article.

4,681,717

PROCESS FOR THE CHEMICAL PREPARATION OF HIGH-FIELD ZNO VARISTORS

Robert A. Brooks, Tijeras; Robert G. Dosch, and Bruce A. Tuttle, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 19, 1986, Ser. No. 830,812
Int. Cl.[4] C04B *33/34;* **H01B** *1/06*
U.S. Cl. 264—61 **6 Claims**

1. In a process for the production of a varistor precursor by intimate mixing of zinc oxide, bismuth oxide, and at least one additional metal oxide dopant, the improvement comprising:

mixing the oxides by

(a) precipitating zinc or coprecipitating zinc and at least one additional metal from a solution of chloride salts thereof by means of an inorganic hydroxide,

(b) converting said precipitate to oxides by calcining at 400–600 degrees C., and

(c) precipitating bismuth on the surface of said oxides by contacting with a solution of Bi dissolved in HNO_3;

wherein said additional oxide dopant is MnO, CoO, or a mixture thereof, and wherein the proportions of oxides in said resulting precursor are about:

93–98.5 mole% Zn
0–1.0 mole% Co
0–1.2 mole% Mn
0.1–6.0 mole% Bi.

4,681,718

METHOD OF FABRICATING COMPOSITE OR ENCAPSULATED ARTICLES

Susan L. Oldham, Long Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 608,614, May 9, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 770,917
Int. Cl.[4] B29C *39/10, 39/24, 39/42*
U.S. Cl. 264—102 **25 Claims**

1. A method for forming a resin based filler reinforced composite article which comprises the steps of:

(a) providing a rigid mold having a cavity therein and an opening in one surface of said mold and communicating with said cavity;

(b) providing a chamber for containing said mold and for applying heat and varying pressures to said cavity of said mold;

(c) heating said chamber to a predetermined temperature and maintaining said temperature in said chamber;

(d) loading a quantity of a particulate filler material in said cavity of said mold;

(e) loading said mold containing said filler into said heated chamber;

(f) filling the mold cavity with a low viscosity heat curable themosetting resin which cures at said predetermined temperature;

(g) evacuating the mold cavity to a subatmospheric pressure within the range of about 1 to 200 millimeters of mercury for about 1 to 5 minutes, to impose a vacuum on the mold to thereby impregnate the filler material with the resin, degas the mold contents, and expand any remaining voids in the resin;

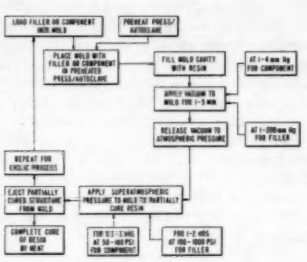
(h) releasing the vacuum to atmospheric pressure to collapse any gas bubbles remaining in the mold contents;

(i) applying a superatmospheric pressure within the range of about 100, to 1000 pounds per square inch (about 6.90×10^5 to 6.90×10^6 pascals) for about 1 to 2 hours, to the mold to burst any said gas bubbles and cause the heat curable resin to compact and encapsulate particles of the filler loaded in the mold, the temperature and the superatmospheric pressure being maintained for a time sufficient to partially cure the resin and form a unitary structure;

(j) ejecting the structure from the mold cavity; and

(k) subjecting the ejected structure to a further heating cycle to completely cure the resin.

15. A method for encapsulating an electrical component which comprises the steps of:


LOAD FILLER OR COMPONENT INTO MOLD
PREHEAT PRESS/AUTOCLAVE
PLACE MOLD WITH FILLER OR COMPONENT IN PREHEATED PRESS/AUTOCLAVE
FILL MOLD CAVITY WITH RESIN
AT 1-4 mm Hg FOR COMPONENT
APPLY VACUUM TO MOLD FOR 1-5 MIN
RELEASE VACUUM TO ATMOSPHERIC PRESSURE
AT 1-200 mm Hg FOR FILLER
REPEAT FOR CYCLIC PROCESS
EJECT PARTIALLY CURED STRUCTURE FROM MOLD
APPLY SUPERATMOSPHERIC PRESSURE TO MOLD TO PARTIALLY CURE RESIN
COMPLETE CURE OF RESIN BY HEAT
FOR 0.1-2 MIN AT 50-400 PSI FOR COMPONENT
FOR 1-2 HRS AT 100-1000 PSI FOR FILLER

(a) providing a rigid mold having a cavity therein and an opening in one surface of said mold and communicating with said cavity;

(b) providing a chamber for containing said mold and for applying heat and varying pressures to said cavity of said mold;

(c) heating said chamber to a predetermined temperature and maintaining said temperature in said chamber;

(d) loading the component in said cavity of said mold;

(e) loading said mold containing said component into said heated chamber;

(f) filling the mold cavity with a low viscosity heat curable thermosetting resin which cures at said predetermined temperature;

(g) evacuating the mold cavity to a subatmospheric pressure within the range of about 1 to 4 millimeters of mercury for about 1 to 5 minutes, to impose a vacuum on the mold to thereby impregnate the component with the resin, degas the mold contents, and expand any remaining voids in the resin;

(h) releasing the vacuum to atmospheric pressure to collapse any gas bubbles remaining in the mold contents;

(i) applying a superatmospheric pressure within the range of about 50 to 100 pounds per square inch (about 3.45×10^5 to 6.90×10^5 pascals) for about 30 minutes to 3 hours, to the mold to burst any said gas bubbles and cause the heat curable resin to encapsulate the component loaded in the mold, the temperature and the superatmospheric pressure

being maintained for a time sufficient to partially cure the resin and form a unitary structure;

(j) ejecting the structure from the mold cavity; and

(k) subjecting the ejected structure to a further heating cycle to completely cure the resin.

4,681,719

PRODUCTION OF COMPRESSION MOLDINGS FROM FINELY DIVIDED THERMOPLASTIC POLYMERS

Hans-Henning Vogel, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1985, Ser. No. 742,909

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3421978

Int. Cl.⁴ B29C *11/12*

U.S. Cl. 264—122 **2 Claims**

1. A process for the production of a stable compression molded block of finely divided particles of a thermoplastic polymer, which process comprises:

mixing the polymer particles with from 0.01 to 0.3% by weight, based on the amount of the polymer, of amorphous silica; and

then subjecting the resulting mixture to compression molding at a temperature and pressure sufficient to form a stable comminutable block of polymer particles but insufficient to produce a polymer melt.

4,681,720

METHOD OF AND DEVICE FOR PRODUCING BUNDLES OF HOLLOW FIBERS

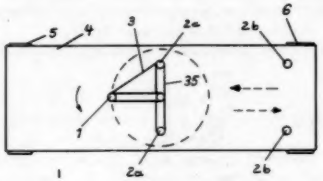
Rudolf Baumgart; Manfred Martin, both of Wuppertal; Lothar Löw, Elsenfeld, and Gunter Scheven, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Jan. 17, 1984, Ser. No. 571,519

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301268

Int. Cl.⁴ B29C *47/20, 53/62;* C08J *9/28*

U.S. Cl. 264—150 **24 Claims**



1. A method of producing bundles of hollow fibers, comprising the steps of

(a) placing at least one pair of stationary take-up elements in a working position and simultaneously placing at least a second pair of stationary take-up elements in a ready position;

(b) winding at least one continuous hollow fiber about the one pair of stationary take-up elements in the working position so as to create thereon a strand of hollow fibers of a desired thickness;

(c) moving said one pair together with the strand away from said working position and simultaneously placing said second pair of stationary take-up elements from the ready position into the working position to start winding of another strand thereon without interrupting the hollow fiber;

(d) then cutting the completed strand into bundles while winding the other strand about the second pair of stationary take-up elements; and

(e) repeating the steps (c) and (d) with the second pair.

4,681,721

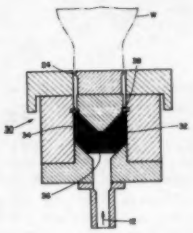
THERMOPLASTIC FILM EXTRUSION PROCESS EMPLOYING DIE WITH FILTERING ARRANGEMENT

Gordon L. Benoit, Macedon, and Dana M. Boyd, Rushville, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,579

Int. Cl.⁴ B29C *47/20*

U.S. Cl. 264—169 **10 Claims**



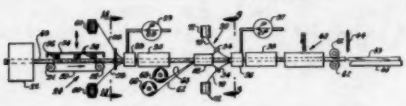
1. In an annular extrusion die for extruding a tubular thermoplastic film web from a polymer melt with an improved polymer flow history; a die body with a central flow chamber having an inlet means for receiving a flow of a polymer melt, and an outlet communicating with a die orifice for extruding said melt to form a film web; first screen means extending across said inlet to said die chamber, and second screen means arranged in the outlet of said flow chamber to said die orifice; said first and second screen means forming an open space therebetween in said die flow chamber; and an inert particulate material filling the space in said die flow chamber intermediate said first and second screen means, said polymer melt being conveyed through the interstices between said particulate material in said die flow chamber so as to impart to said polymer melt a high degree of filtration, homogenation of high molecular weight gels in said polymer melt, a high shear field to erase the previous shear history of the melt, and causing the melt to randomly change its flow direction, cross-sectional area and distribution when passing through said die flow chamber without creating differential shears tending to adversely affect the uniformity and physical properties of the extruded film web.

6. In a method for extruding a tubular thermoplastic film web from a polymer melt with an improved polymer flow history; conducting said polymer melt through a central die flow and filtering chamber having an inlet means for receiving a flow of said polymer melt, and an outlet communicating with an annular die orifice for extruding said tubular film web; first screen means extending across said inlet to said die chamber, and second screen means arranged in the outlet of said flow chamber to said die orifice; said first and second screen means forming an open space therebetween in said die flow chamber; and an inert particulate material filling the space in said die flow chamber intermediate said first and second screen means, conveying said polymer melt through said first screen means, the interstices between said particulate material in said die chamber and second screen means so as to impart to said polymer melt a high degree of filtration, homogenation of high molecular weight gels in said melt, a high shear field to erase the previous shear history of the melt, and causing the melt to randomly change its flow direction, cross-sectional area and distribution when passing through said die flow chamber without creating differential shears tending to adversely affect the uniformity and physical properties of the extruded film web.

4,681,722
METHOD OF MAKING A LINEAL STRUCTURAL MEMBER

Neil A. Carter, Reynoldsburg; Ronald R. Harris, and Russell L. Ault, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 7, 1985, Ser. No. 785,303
Int. Cl.[4] B29C *41/30*; B32B *31/04*
U.S. Cl. 264—171 10 Claims

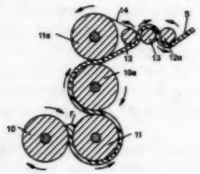


1. A method of making a lineal structural member comprising feeding a shaped, elongated, generally laminar, porous glass fiber core successively through a resin-impregnating die having an exposed inner peripheral resin-filled cavity of a larger dimension, in a direction of core movement, in a pair of opposed portions parallel to laminations of the core than in a pair of opposed portions perpendicular to laminations of the core, to impregnate a generally uniform thickness of resin into only outer surface portions of the core completely around its periphery while maintaining the interior porous, through a curing chamber wherein the resin impregnated into the outer surface portions thereof is cured, through a resin-encasing die wherein resin is injected under pressure to encase the resin-impregnated core, and through a curing die wherein the encasing resin is cured to form the structural member.

4,681,723
CALENDER BAND STRIPPING SECTION AND PROCESS FOR STRIPPING CALENDERED SHEET

Randy D. Jester, Greer, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 1, 1985, Ser. No. 794,347
Int. Cl.[4] B29C *43/24*
U.S. Cl. 264—175 10 Claims



1. An apparatus for the manufacture of a continuous sheet of thermoplastic material consisting essentially of:

a plurality of calender rolls in cooperating relationship;

at least one stripper roll;

means for imparting rotational movement to said calender rolls and stripper roll, whereby the last calender roll is operated at the same or greater rotational speed than the preceding calender roll, and

an inelastic, flexible, endless belt, capable of efficient heat transfer, which is in close contact with and travels around said stripper roll and the last of said calender rolls, and

means for removing a continuous sheet of thermoplastic material from the endless belt in the vicinity of said stripper roll.

6. A process for the manufacture of a continuous sheet of thermoplastic material consisting essentially of:

(i) heating a thermoplastic material to a thermoplastic state;

(ii) forming said thermoelastic material into a flexible, continuous sheet by means of a calender having a plurality of rolls, with the last calender roll in close contact with an inelastic, flexible, endless belt capable of efficient heat transfer which travels around said calender roll and which endless belt is in also close contact with and travels around a stripper roll;

(iii) removing said flexible sheet from said calender by contacting said flexible sheet with said endless belt, rather than the last roll of the calender, and conveying said flexible sheet away from the calender and towards said stripper roll;

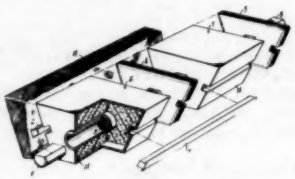
(iv) continuously cooling said flexible sheet;

(v) removing said cooled flexible sheet from said endless belt.

4,681,724
REMOVABLE IRREVERSIBLY SHRINKING MALE MANDREL

Robert L. Faiz, Sandy Hook; William J. Walker, Monroe; Philip Ramey, Milford; Kenneth M. Adams, Sandy Hook; Nicholas P. Flonc, Hamden, and Dean Nguyen, Stamford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,898
Int. Cl.[4] B29C *1/08*
U.S. Cl. 264—257 18 Claims



1. A removable male mandrel for composite resin transfer molding processes, said male mandrel comprising:

a. a foam that is dimensionally stable at a first temperature;

b. said foam capable of irreversibly shrinking to less than about 0.5 said foam's original size at a second temperature that is above said first temperature; and

c. said foam encapsulated by a non-stick elastomer skin.

4,681,725
INJECTION SKIS AND THEIR PROCESS OF MANUFACTURE

Tetsuzo Maruyama, Liyama, Japan, assignor to Kabushiki Kaisha Swallow Ski, Nagano, Japan

Division of Ser. No. 662,787, Oct. 19, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,366
Claims priority, application Japan, Oct. 21, 1983, 58-197895; Mar. 29, 1984, 59-062638; Apr. 5, 1984, 59-068302; Apr. 11, 1984, 59-073627
Int. Cl.[4] A63C *5/00, 5/04, 5/12*
U.S. Cl. 264—46.5 7 Claims

1. A process for manufacturing injection skis, comprising the steps of:

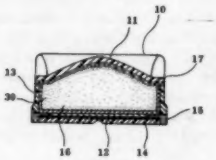
disposing a ski lower-surface constituting material comprising glide surface material in a lower mold;

disposing a sheet-shaped ski upper-surface constituting material capable of being deformed by foaming pressure at a position spaced above said ski lower-surface constituting material to form a space between said ski lower-surface constituting material and said ski upper-surface constituting material;

disposing an upper mold having an upward concave surface being equivalent to a mountain-shaped projection on the center of the upper surface of a complete ski on the upper

side of said ski upper-surface constituting material and on top of said lower mold;

injecting a foamy resin into said space between said ski upper and lower-surface constituting materials; and



expanding said foamy resin to force said sheet-shaped ski upper-surface constituting material against said concave surface of said upper mold by the foaming pressure of said foamy resin and to form a mountain-shaped projection on the upper surface of the ski corresponding to said upward concave surface of said upper mold.

4,681,726

FAST BREEDER REACTOR

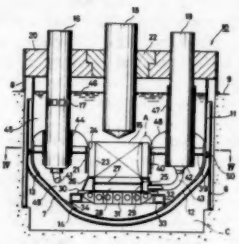
Akio Sakurai, Kashiwa, and Ryoichi Kato, Hitachi, both of Japan, assignors to Central Research Institute of Electric Power Industry and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,981

Claims priority, application Japan, Oct. 24, 1983, 58-197696

Int. Cl.[4] G21G *1/04*; G21C *9/00*

U.S. Cl. 376—171 **20 Claims**



1. A fast breeder reactor comprising:

a nuclear reactor container filled with a liquid metal;

a reactor core disposed within said nuclear reactor container;

a first supporting structural member mounted to a first position of said nuclear reactor container so as to support said reactor core;

a cylindrical structural member surrounding the periphery of said reactor core so as to define an annular gap between said cylindrical structural member and said reactor core for allowing said liquid metal to fully exist therein, said cylindrical structural member being independent of said reactor core and said first structural member; and

a second supporting structural member mounted to a second position of said nuclear reactor container so as to support said cylindrical structural member, said second position of said nuclear reactor container being substantially apart from said first position.

4,681,727

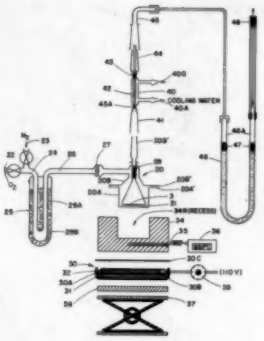
PROCESS FOR PRODUCING ASTATINE-211 FOR RADIOPHARMACEUTICAL USE

Saed Mirzadeh, East Setauket, and Richard M. Lambrecht, Quogue, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 10, 1984, Ser. No. 598,624

Int. Cl.[4] G21G *1/10*

U.S. Cl. 376—198 **5 Claims**



1. A one-step chemical manipulation in combination with a distillation and collection process for producing At-211 comprising;

a. providing a target of irradiated Bismuth coated to a predetermined thickness of a backing member,

b. providing a vapor-producing still operably connected with a condenser that has a water cooled condensate collector formed of a dry silica gel mesh therein maintained at a temperature above the freezing point of water, and providing an effluent gas filter that is operably connected to receive effluent gas from the condenser,

c. heating the target in said still at a temperature in the range of about 630°-680° C. for a time period in the range of 50 to 80 minutes, to evole At-211 vapor from said target,

d. providing a dry carrier gas having an oxygen concentration that is sufficient to form Bi_2O_3 thereby to essentially preclude vaporization of Bi metal, passing said carrier gas through said still to carry the At-211 vapor to said condenser, and to carry effluent from the condenser to the effluent gas filter,

e. eluting At-211 from the condensate collector of said condenser with a controlled volume of eluent containing predetermined solvents that are compatible with a given desired radiopharmaceutical procedure, and

f. collecting said At-211 in said controlled volume of eluent for use in said given radiopharmaceutical procedure.

4,681,728

NUCLEAR REACTOR

Luciano Veronesi, O'Hara Township, Allegheny County, Pa.; Franklin D. Obermeyer, Pensacola, Fla., and James R. Chrise, Trafford, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

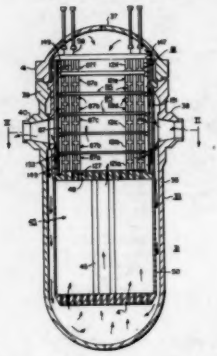
Filed Mar. 22, 1985, Ser. No. 715,125

Int. Cl.[4] G21C *7/10*, *7/12*

U.S. Cl. 376—209 **14 Claims**

1. A nuclear reactor including a core having a plurality of fuel assemblies, upper internals, and neutron-flux adjusting rods and means for moving said neutron-flux adjusting rods between said fuel assemblies and said upper internals, said upper internals including guide means for guiding said neutron-flux adjusting rods, said guide means including a plurality

of columnar guides for guiding certain of said neutron-flux adjusting rods, each said columnar guide of said plurality including a plurality of coextensive generally vertical guide sections aligned to receive said certain neutron-flux adjusting rods, said guide means also including a plurality of generally horizontal plate sections connected to said guide sections and positioned generally vertically along said upper internals, each said plate section being nested in the manner of a "jig-saw" puzzle and being secured to, adjacent plate sections at the generally vertical level of said each plate section to form an integrated composite plate at each said level extending laterally substantially throughout the upper internals, each said plate section having perforations patterned to pass others of



said neutron-flux adjusting rods, said plate sections being oriented each at its generally vertical level with their perforations for said others of said neutron-flux adjusting rods aligned so that said composite plates serve as guides for said others of said neutron-flux adjusting rods.

2. The nuclear reactor of claim 1 wherein the certain neutron-flux adjusting rods include control rods, and gray rods, and the other neutron-flux adjusting rods include only water-displacement rods, said certain neutron-flux adjusting rods being guided by the columnar guides each of which is formed of a plurality of aligned generally vertical guide sections, and said other neutron-flux adjusting rods being guided by the integrated composite plates.

4,681,729

MONITORING TEMPERATURE WITHIN A VESSEL

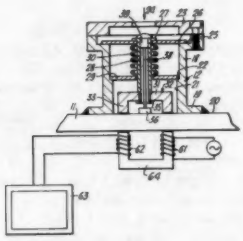
Eric Pendleton, Culcheth; Karl A. Roberts, Warrington, and Alan Murray, Roby, all of England, assignors to National Nuclear Corporation Limited, London, England

Filed May 6, 1985, Ser. No. 731,035

Claims priority, application United Kingdom, May 21, 1984, 8412982

Int. Cl.[4] G21C *17/00;* **G01K** *13/02*

U.S. Cl. 376—247 **11 Claims**



1. A vessel provided internally with a device for enabling external detection of temperature changes within the vessel, said device comprising a permanent magnet, means mounting the magnet within the vessel for movement towards and away from a boundary wall of the vessel, means having sufficient magnetic coupling with the magnet to restrain the magnet against movement away from a predetermined position with espect to said boundary wall of the vessel, and temperature-responsive means for urging the magnet away from said predetermined position such that, in the event of a substantial rise in temperature within the vessel, the latter means becomes effective to move the magnet relative to the boundary wall to vary the magnetic field strength detectable by detector means located on the external side of said boundary wall.

4,681,730

PROCESS AND DEVICE FOR DETECTING LEAKING NUCLEAR FUEL ELEMENTS IN A NUCLEAR ASSEMBLY

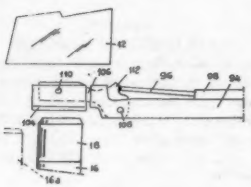
Daniel Beuneche, Collonges au Mont d'Or; Christian Mauvieux, Lyons, and Pierre Amiet, Condrieu, all of France, assignors to Fragema, Courbevoie, France

Filed Nov. 27, 1985, Ser. No. 802,276

Claims priority, application France, Nov. 29, 1984, 84 18223

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—252 **7 Claims**



4. A device for detecting leaking fuel elements in an irradiated fuel assembly comprising a bundle of said fuel elements held in a rigid structure including end pieces connected together by braces, each of said fuel elements having a fluid tight sheath, stack of nuclear fuel pellets in said sheath and an end cap closing an end of said sheath and stack, said device comprising:

(a) an ultrasonic transducer carried by rod means of dimensions such that they can be inserted into said assembly between one of said end pieces and caps of said elements,

(b) crossed movement maneuvering means for bringing said transducer above said fuel elements, wherein said maneuvering means comprise means for moving the rod means in a direction transversal to the elements between said one of said end pieces and the caps of said elements and in the longitudinal direction of the elements and wherein the transducer is fixed on said rod means with at least one degree of freedom about a shaft transversal to the element so as to be able to be applied against the end face of caps of said elements.

4,681,731

NUCLEAR REACTOR CONSTRUCTION WITH BOTTOM SUPPORTED REACTOR VESSEL

John E. Sharbaugh, Bullskin Township, Fayette County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,592

Int. Cl.[4] G21C *9/00*

U.S. Cl. 376—285 **16 Claims**

1. An improved liquid metal nuclear reactor construction comprising:

(a) a nuclear reactor core having a bottom platform support structure;

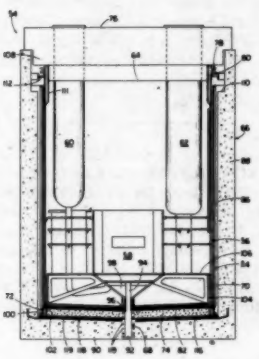
(b) a reactor vessel for holding a large pool of low pressure liquid metal coolant and housing said core within said pool, said vessel having an open top end, a closed bottom end wall and a continuous closed side wall interconnecting said top end and bottom end wall;

(c) a containment structure surrounding said reactor vessel and having a sidewall spaced outwardly from said reactor vessel side wall and having a base mat spaced below said reactor vessel bottom end wall;

(d) a central small diameter post anchored to said containment structure base mat and extending upwardly therefrom to said reactor vessel and upwardly therefrom to said reactor core so as to axially fix said bottom end wall of said reactor vessel and provide a center column support for said lower end of said reactor core;

(e) annular support structure disposed in said reactor vessel on said bottom end wall thereof and extending about said lower end of said core

(f) structural support means disposed between said containment structure base mat and bottom end of said reactor vessel wall and cooperating with said annular support structure and said central post for supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to allow said reactor vessel to expand



radially but substantially prevent any lateral motions that might be imposed by the occurrence of a seismic event;

(g) a bed of insulating material disposed between said containment structure base mat and said bottom end wall of said reactor vessel and uniformly supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to insulate said reactor vessel bottom end wall from said containment structure base mat and allow said reactor vessel bottom end wall to freely expand radially from said central post as it heats up while providing continuous support thereof;

(h) a deck supported upon said side wall of said containment vessel above said top open end of said reactor vessel; and

(i) extendible and retractable coupling means extending between said deck and said top open end of said reactor vessel and flexibly and sealably interconnecting said reactor vessel at its top end to said deck.

11. An improved liquid metal nuclear reactor construction comprising:

(a) a nuclear reactor core having a bottom platform support structure;

(b) a generally cylindrical reactor vessel for holding a large pool of low pressure liquid metal coolant and housing said core within said pool, said vessel having an open top end, a closed flat bottom end wall with and a continuous cylindrical closed side wall interconnecting said top end and bottom end wall;

(c) a generally cylindrical concrete containment structure surrounding said reactor vessel and having a cylindrical side wall spaced outwardly from said reactor vessel side wall and having a flat base mat spaced below said reactor vessel bottom end wall;

(d) a central small diameter post anchored to said containment structure base mat and extending upwardly therefrom to said reactor vessel and upwardly therefrom to said reactor core so as to axially fix said bottom end wall of said reactor vessel and provide a center column support for said lower end of said reactor core;

(e) annular reinforced support structure disposed in said reactor vessel on said bottom end wall thereof and extending about said lower end of said core so as to support the periphery thereof while allowing radial expansion to occur

(f) an annular support ring having a plurality of inward radially extending linear members being disposed between said containment structure base mat and bottom end of said reactor vessel wall and connected to and supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to allow said reactor vessel to expand radially but substantially prevent any lateral motions that might be imposed by the occurrence of a seismic event.

(g) a bed of insulating material in sand-like granular form disposed between said containment structure base mat and said bottom end wall of said reactor vessel and uniformly supporting said reactor vessel at its bottom end wall on said containment structure base mat so as to insulate said reactor vessel bottom end wall from said containment structure base mat and allow said reactor vessel bottom end wall to freely expand radially from said central post as it heats up while providing continuous support thereof;

(h) a deck supported upon said side wall of said containment structure above said top open end of said reactor vessel;

(i) a plurality of serially connected extendible and retractable annular bellows extending between said deck and said top open end of said reactor vessel and flexibility and sealably interconnecting said reactor vessel at its top end to said deck; and

(j) an annular guide ring with axially positioned radial keys and keyways disposed on said containment structure and extending between its side wall and said top open end of said reactor vessel for providing lateral support of said reactor vessel top opened by limiting imposition of lateral loads on said annular bellows by the occurrence of a lateral seismic event while allowing axial expansion to occur.

4,681,732

METHOD OF AND DEVICE FOR THE REDUCTION OF REACTIVITY OF A NUCLEAR REACTOR CORE

Werner Mallener, Düsseldorf, and Theodor Overhoff, Niederzier, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 656,989

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3335839

Int. Cl.[4] **G21C** *7/06*

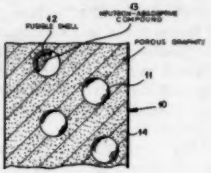
U.S. Cl. 376—337 **9 Claims**

1. In a method of reducing the reactivity of and shutting down a gas-cooled graphite-moderated nuclear reactor having a reactor core containing fuel elements of nuclear fuel embedded in graphite and having graphitic surfaces along which a cooling gas can flow, the improvement which comprises the steps of:

(a) forming quenching-element particles by enclosing and sealing in a sheath stable at temperatures below a predetermined shutdown temperature for said core, a neutron-absorbing substance which is in a gas phase above said predetermined shutdown temperature, the sealing of said particles by said sheath ceasing upon heating of said parti-

cles to a temperature above said predetermined shutdown temperature;

(b) incorporating a plurality of said particles in a graphite body permeable to said neutron-absorbing substance in said gas phase to form a quenching element, said graphite body having an outer surface permeable to said neutron-absorbing substance in said gas phase; and



(c) introducing at least one of said graphite bodies into said core of said nuclear reactor so that said body is present during normal operation but, upon an elevation of the temperature of said core above said predetermined shutdown temperature, said substance is liberated from said particles, penetrates through said body in the form of a gas and deposits on free graphite surfaces of said core, said particles each having a size sufficient to render them self-shielding againt neutron flux in said core.

4,681,733

PROCESS FOR FIXING ALLOY POWDER MOLDING AT SINTERING

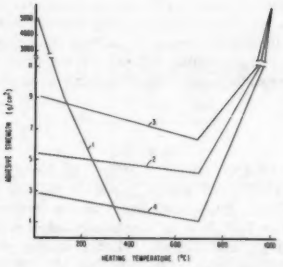
Toshiharu Konishi; Yukio Shimizu; Takahumi Sakuramoto, all of Osaka; Tsuyoshi Morishita, and Shigemi Osaki, both of Hiroshima, all of Japan, assignors to Nitto Electric Industrial Co., Ltd.: Mazda Motor Corporation, Japan

Continuation of Ser. No. 705,180, Feb. 25, 1985, abandoned. This application Sep. 18, 1985, Ser. No. 777,563

Claims priority, application Japan, Feb. 24, 1984, 59-34887

Int. Cl.[4] B22F *7/00*

U.S. Cl. 419—8 **6 Claims**



1. A method of sintering an alloy powder molding which comprises placing an alloy powder molding which is formed by rolling a mixture of an alloy powder and a synthetic resin-based pressure-sensitive adhesive composition, on a metal base material by interposing a composition between the alloy powder molding and the metal base material, keeping the assembly at 150° to 400° C. for at least 5 minutes under a non-oxidizing atmosphere, and sintering the alloy powder molding at a sintering temperature, the improvement wherein the composition at a sintering temperature, the improvement wherein the composition comprises as a main component an acrylic copolymer which comprises about 80 to 99.5% by weight of alkyl (meth)-acrylate having an average carbon atom number of 2 to 12 in the alkyl moiety and about 20 to 0.5% by weight of a polymerizable monomer having a functional group in the molecule or a mixture of 100 parts by weight of the copolymer and about 0.1 to 100 parts by weight of a resin which gives adhesive property, the composition having a 10 second shear creep compliance of about 0.1 to 30×10^{-6} cm^2/dyne at room temperature and at least about 30% by weight of non-volatile materials when heated at 300° C. for 80 minutes under a non-oxidizing atmosphere.

4,681,734

HEAT SPRAYING MATERIAL AND MANUFACTURING PROCESS THEREOF

Wolfgang Simm, Ecublens, and Hans-Theo Steine, Chavannes, both of Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland

PCT No. PCT/CH85/00011, § 371 Date Sep. 26, 1985, § 102(e) Date Sep. 26, 1985, PCT Pub. No. WO85/03465, PCT Pub. Date Aug. 15, 1985

PCT Filed Jan. 24, 1985, Ser. No. 783,933

Claims priority, application Switzerland, Jan. 31, 1984, 432/84

Int. Cl.[4] B22F *7/00*

U.S. Cl. 419—9 **12 Claims**

1. A method of manufacture of a powdery material for thermal spraying, characterized in that a molten alloy of composition by weight: chromium: 10 to 30%; aluminium: 1 to 25%; carbon: less than 0.5%; nickel: less than 10%; iron: the remainder; is subjected to atomization from the liquid state with a cooling speed of at least 400° C./sec. and ranging up to 5000° C./sec., so as to produce a powder having a grain size of from −150 to +27 microns, the specific surface of which is higher than 500 cm^2/g.

4,681,735

USE OF SILVER-FREE PALLADIUM ALLOYS FOR FIRING ON DENTAL CERAMICS

Werner Groll, Karlstein; Gernot Schöck, Bruchköbel; Doris Hathaway, Hanau, and Rudolf Wagner, Remchingen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,246

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522523

Int. Cl.[4] C22C *5/04*

U.S. Cl. 420—464 **6 Claims**

1. A silver-free palladium alloy suitable as a material for baking on a dental ceramic consisting of 60 to 80% palladium, 0 to 8% gold, 0 to 5% platinum, 0 to 1% of ruthenium, rhenium, or of both ruthenium and rhenium, 2 to 20% copper, 1 to 12% of tin, indium, or of both tin and indium, 0.2 to 5% of at least one of the elements tungsten, molybdenum, niobium, and tantalum, and 0 to 15% cobalt, with the proviso that the sum of tin and indium must be between 5 and 14%.

4,681,736

ALUMINUM ALLOY

Michael M. Kersker, Beverly, Mass.; William G. Truckner, Avonmore, Pa.; Douglas A. Granger, Murrysville, Pa., and Elwin L. Rooy, Franklin Park Borough, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 7, 1984, Ser. No. 679,550

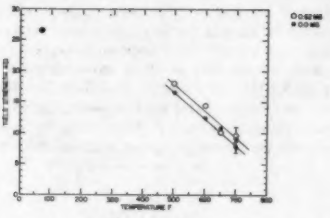
Int. Cl.[4] C22C *21/02*

U.S. Cl. 420—535 **7 Claims**

1. An aluminum alloy consisting essentially of about the following percentages of materials:

Si=15.5 to 16.5
Fe=0.55 to 0.65
Cu=4.7 to 5.3
Mg=up to 0.65
Ni=5.2 to 5.8
Ti=0.03 to 0.05

P=0.005 to 0.015 (recovered)
remainder Al and incidental impurities.



2. An aluminum alloy as claimed in claim 1 further containing about the following percentage of Mg:
Mg=0.55 to 0.65.

4,681,737
STABILIZED SODIUM ERYTHORBATE BOILER CORROSION INHIBITOR COMPOSITIONS AND METHODS

Jerry L. Walker, Coraopolis, and John D. Zupanovich, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Sep. 17, 1985, Ser. No. 777,046
Int. Cl.[4] C23F *11/04*; C02F *1/70*; C09K *3/00*
U.S. Cl. 422—16 **9 Claims**

1. A method of inhibiting corrosion in boilers comprising adding to boiler feedwater containing oxygen an effective amount of a chelant-stabilized aqueous solution of sodium erythorbate, wherein said chelant is selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof, and wherein said chelant is present at a chelant:sodium erythorbate weight ratio of from about 0.001:1 to 1:1, based on active sodium erythorbate.

5. A composition comprising: (a) an aqueous solution of sodium erythorbate and (b) a chelant selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof, wherein said chelant is present at a chelant:sodium erythorbate weight ratio of from about 0.001:1 to 1:1, based on active sodium erythorbate, and wherein said sodium erythorbate is stabilized by said chelant against oxidative degradation.

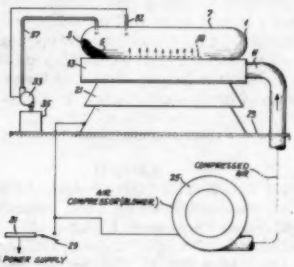
7. A method of stabilizing an aqueous solution of sodium erythorbate against oxidative degradation comprising adding to said sodium erythorbate aqueous solution an effective amount of a chelant selected from the group consisting of nitrilotriacetic acid, ethylenediamine tetraacetic acid, N(hydroxyethyl)ethylenediamine triacetic acid, citric acid, and salts thereof.

4,681,738
METHOD AND APPARATUS FOR STERILIZING OBJECTS

Sidney Low, Black Stump Rd., R.R. 1 Box 873, Weems, Va. 22576

Filed Feb. 4, 1986, Ser. No. 825,580
Int. Cl.[4] A01N *25/08, 25/12*; A61L *2/18*; B08B *7/04*
U.S. Cl. 422—28 **6 Claims**

1. A method of sterilizing an object comprising immersing the object in an agitated bed of porous particles impregnated with a liquid disinfectant such that the particles strike a surface of the object immersed therein and release a micro-thin film of



the liquid disinfectant onto the surface of the object, thereby killing pathogens on said surface of the object.

4,681,739
USE OF CHLORINE DIOXIDE GAS AS A CHEMOSTERILIZING AGENT

David H. Rosenblatt, Baltimore, Md.; Aaron A. Rosenblatt, New York, N.Y., and Joseph A. Knapp, Pittsburgh, Pa., assignors to The Scopas Technology Co., Inc., New York, N.Y.

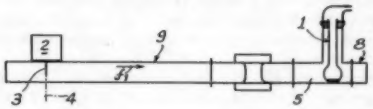
Continuation-in-part of Ser. No. 435,331, Oct. 19, 1982, Pat. No. 4,504,442. This application Apr. 18, 1984, Ser. No. 601,443
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[4] A61L *1/00*
U.S. Cl. 422—37 **60 Claims**

1. A method for sterilizing the surface of an article wherein the surface is at least substantially gas impermeable and said surface is contaminated with bacterial spores comprising the steps of exposing the spores on said surface to a humid gaseous atmosphere effective to enhance the susceptibility of said spores to subsequent chemosterilization with chlorine dioxide gas, and then exposing said spores present on said surface to an amount of gaseous chlorine dioxide in an inert carrier gas effective to sterilize said surface by killing the spores.

4,681,740
APPARATUS FOR THE CHEMICAL REACTION BY WET PROCESS OF VARIOUS PRODUCTS

Roger Commarmot, Lyons; Dominique Didenot, Meyzieu, and Jean-Francois Gardais, Chuzelles, all of France, assignors to Societe Prolabo, Paris, France

Filed Feb. 27, 1985, Ser. No. 706,339
Claims priority, application France, Mar. 2, 1984, 84 03496
Int. Cl.[4] G01N *31/16*
U.S. Cl. 422—78 **7 Claims**



1. An apparatus for wet process chemical reactions comprising (i) a micro-wave generator for emitting micro-waves into a micro-wave heating chamber, (ii) a micro-wave heating chamber adapted to contain a sample of product to be heated to form a composition by association with at least one specific reagent, said micro-wave heating chamber comprising a wave guide into which said micro-wave generator emits, said wave guide having an upper wall and defining in said upper wall an opening and wherein an end of the wave guide, located opposite the micro-wave generator with respect to the opening, is

equipped with a water trap chamber, (iii) sample container means having an enlarged sample containing portion at a lower end thereof disposed within said micro-wave heating chamber and an upwardly extending neck portion extending through said opening in said upper wall of such micro-wave heating chamber, and (iv) a stack bordering said opening in said upper wall of said micro-wave heating chamber and rising to a height which is sufficient to form an absorption barrier opposing the propagation of micro-waves outside the micro-wave heating chamber.

4,681,741

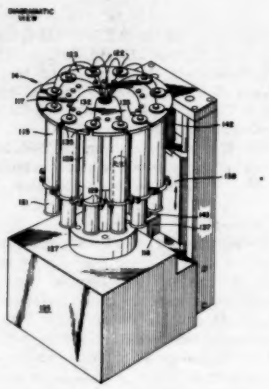
REAGENT DISPENSER FOR AN ANALYZING SYSTEM

Richard W. Hanaway, Roseville, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 750,791, Jul. 1, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 943,820

Int. Cl.[4] B01L *3/02;* **B01J** *35/00*

U.S. Cl. 422—100 **9 Claims**



1. A reagent dispenser assembly for use in an automated analysis system, said dispenser comprising:

a dispensing station;

a plurality of reagent supply containers associated with said dispensing station;

means for positioning a desired one of said reagent containers at said dispensing station for dispensing a desired amount of reagent therefrom;

means acting on said desired one of said containers at said dispensing station for dispensing therefrom a desired amount of reagent, said dispensing means comprising a plurality of plungers, with each respective plunger being associated with a respective reagent container, the position of each plunger relative to its associated container being determined by the amount of reagent remaining in its container;

a means separate from said containers and plungers for moving said plunger associated with said one of said containers to dispense said desired amount of reagent irrespective of the position of the plunger of said one of said containers prior to said reagent being dispensed, said means for moving said plunger associated with said one of said containers comprises an anvil for engaging said plunger, said anvil being arranged for movement longitudinally of said desired one of said reagent containers, a means for driving said anvil to move it selectively between a first home position where it does not engage said plunger, a second dispense start position where it first engages said plunger and a third finish position where it pushes the plunger in order to dispense said desired amount of reagent; and

control means for coordinating the movement of said anvil between its respective positions to dispense said desired amount of said reagent, said control means including means for sensing the first engagement between said anvil and said plunger and responsive thereto, said control means causes said anvil to move to its third position whereby the amount of reagent dispensed is a function of the movement of said anvil between the second dispense start position, which is determined by said means for sensing the first engagement, and said third position.

4,681,742

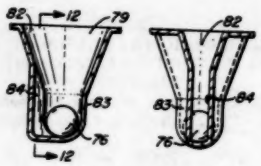
ASSAY TRAY

Larry J. Johnson, San Jose; Stephen R. Coates, Orinda, and Rueyming Loor, Hercules, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Oct. 1, 1984, Ser. No. 656,234

Int. Cl.[4] G01N *33/50, 35/00*

U.S. Cl. 422—102 **15 Claims**



1. An assay tray for carrying out an assay wherein a particulate solid phase is contacted with one or more liquids said tray comprising a plate having a plurality of vertical wells therein for receiving an equal number of solid phase elements and one or more liquids, said wells having

sump means in the bottoms thereof which are unobstructedly accessible from the tops of the wells such that liquids may be essentially completely aspirated from the wells by aspiration apparatus lowered into from the tops of the wells;

a solid phase positioning means in and the sump means comprising an integral part of the structure of each of said wells for positioning a solid phase element in each well such that when said wells are in an upright position a solid phase element placed in any one well in contact with said solid phase positioning means always moves under the influence of gravity to a predetermined location in said any one well away from said sump means.

4,681,743

CATALYTIC CRACKING APPARATUS

Frank W. Skraba, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 541,933, Oct. 14, 1983, abandoned. This application Oct. 10, 1985, Ser. No. 786,276

Int. Cl.[4] B01J *8/18*

U.S. Cl. 422—140 **9 Claims**

1. Apparatus comprising:

(a) a catalyst lift pot having an upper end, a lower end, and a generally cylindrical sidewall having an interior surface defining a first diameter;

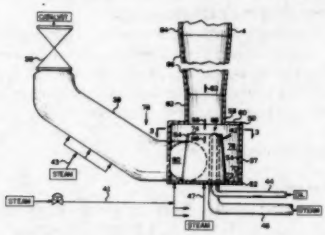
(b) a riser-reactor connected to the upper end of the lift pot, said riser-reactor having a mouth defining a second diameter where it connects to the lift pot which is smaller than the lift pot first diameter;

(c) a plug member extending axially into the lift pot from the lower end of the lift pot, said plug member being generally rotationally symmetric about its longitudinal axis and having an upper end surface which faces the mouth of the riser-reactor, said lift pot, said riser-reactor and said plug

member being construct and arranged so that fluid flowing through the lift pot before flowing into the riser-reactor flows radially inward across the upper end surface of the plug member;

(d) a means for introducing a fluidizable catalyst through the sidewall of the catalyst lift pot between the plug member and the generally cylindrical interior surface of the lift pot; and

(e) a means for releasing a liquid oil feedstock and an atomizing fluid into the lift pot from the upper end surface of the plug member, wherein the means for releasing liquid oil feedstock and atomizing fluid comprises at least one bifluid nozzle opening into the lift pot on the upper end



surface of the plug member, wherein said at least one nozzle comprises an outer tube, having an end, and a coaxially positioned inner tube, having an end and a side wall, defining an annulus between the inner tube and outer tube, the end of the outer tube being connected to the outside of the inner tube by a wall, the end of the inner tube protruding past the end of the outer tube and having a cap affixed thereto with a slot extending at least partially across it, the sidewall of the inner tube having a plurality of apertures connecting the inside of the inner tube and the annulus between the inner tube and the outer tube, and a plate baffle mounted inside of the inner tube and extending partially thereacross.

4,681,744

HEAT RECOVERY DEVICE

Jacob Weitman, Tryffelstigen 8, S-611 63 Nyköping, Sweden

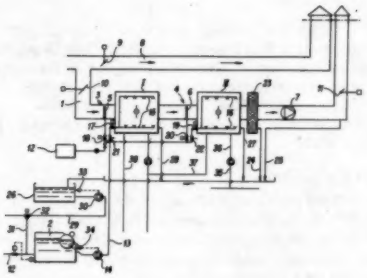
PCT No. PCT/SE85/00031, § 371 Date Sep. 26, 1985, § 102(e) Date Sep. 26, 1985, PCT Pub. No. WO85/03342, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 25, 1985, Ser. No. 783,229

Claims priority, application Sweden, Jan. 27, 1984, 84580026

Int. Cl.[4] B01D *53/34*

U.S. Cl. 422—173 **6 Claims**



1. A heat recovery device for recovering heat from gases such as sulphurous corrosive flue gases and gases containing organic acids, comprising a first and second indirect heat exchanger means with primary and secondary sides respectively, the corrosive gases being passed in series through the primary sides of the first and second heat exchanger means, the secondary sides of the first and second heat exchanger means being connected to heat absorbing medium flows and means for applying a protective controllable thin layer of a fluid onto the surfaces of the first and second heat exchanger means, wherein the amount of the heat absorbing medium passed through the secondary side of the first heat exchanger means is so related to the amount of flue gases passing through the primary side of the first heat exchanger means that the gas temperature is lowered in a first step past the acid dew point and wherein the amount of the heat absorbing medium passed through the secondary side of the secondary exchanger means is so related to the amount of the treated flue gases passing through the primary side of the second heat exchanger means that the gas temperature is lowered in a second step past the water dew point so as to protect the surfaces of said first and second heat exchanger means from corrosion.

4,681,745

AMMONIA PRODUCTION PROCESS

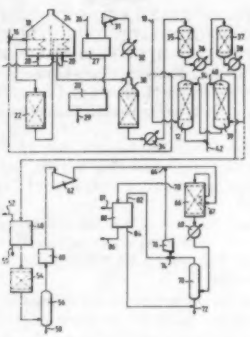
Alwyn Pinto, Linthorpe, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 482,224, Apr. 5, 1983, abandoned. This application May 9, 1985, Ser. No. 732,263

Claims priority, application United Kingdom, Apr. 14, 1982, 8210834; Apr. 14, 1982, 8210835

Int. Cl.[4] C01C *1/04*

U.S. Cl. 423—359 **7 Claims**



1. An ammonia production process which comprises the steps of:

(a) primary catalytically reforming a hydrocarbon feedstock with steam over an externally heated catalyst at superatmospheric pressure and in conditions of steam-to-carbon ratio, pressure and temperature to produce a gas containing carbon oxides, hydrogen, and at least 10% v/v of methane on a dry basis;

(b) secondary catalytically reforming the gas from step (a) by introducing air and bringing the mixture towards equilibrium, whereby to produce a gas containing nitrogen, carbon oxides, hydrogen and a decreased quantity of methane;

(c) converting carbon monoxide catalytically with steam to carbon dioxide and hydrogen;

(d) removing carbon oxides to give fresh nitrogen-hydrogen ammonia synthesis gas, the quantity of air used in step (b) being such that the fresh ammonia synthesis gas contains more than 1 molecule of nitrogen per 3 molecules of hydrogen;

(e) adding to the fresh ammonia synthesis gas recycle gas including a stream enriched in hydrogen, the rate of flow

of said stream enriched in hydrogen being such that the mixture of the fresh ammonia synthesis gas and the recycle gas has a hydrogen to nitrogen molar ratio in the range 1.0 to 2.5;

(f) passing the mixture of the fresh synthesis gas and recycle gas over a synthesis catalyst to produce reacted gas containing ammonia and recovering ammonia from the reacted gas, recycling part of the reacted gas after recovery of ammonia therefrom as part of said recycle gas;

(g) from the remainder of said reacted gas separating a stream enriched in hydrogen leaving a residual stream, returning the enriched stream to the synthesis as the remainder of said recycle gas; and

(h) using the residual stream as fuel to supply heat to the externally heated catalyst in step (a), step (b) being operated under such conditions that the outlet methane content from step (b) is such that the residual stream contains methane amounting to 5–15% by carbon atoms of the hydrocarbon feedstock fed to step (a).

4,681,746

METHOD OF REGULATING THE AMOUNT OF REDUCING AGENT ADDED DURING CATALYTIC REDUCTION OF NO_x CONTAINED IN FLUE GASES

Stanislaw Michalak, Hespert; Klaus-Dieter Weber, Reichshof, and Jürgen Meier, Wiehl, all of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 661,892, Oct. 17, 1984, Pat. No. 4,565,679. This application Oct. 4, 1985, Ser. No. 784,721

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337793

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] B01J *8/06;* **C01B** *21/00, 31/00*

U.S. Cl. 423—239 **2 Claims**

1. In a process of regulating the amount of reducing agent added during the catalytic reduction of NO_x of flue gases originating from a combustion installation fired with fossil fuels with which an adjustment value to be used for regulation of a quantity of reducing agent to be added is determined selectively, in response to a prescribed reducing agent/NO_x stoichiometry factor, from the quantity of combustion air supplied to the combustion installation, as well as from the quantity of exiting flue gas, plus the NO_x concentration downstream ahead of the catalyzer; the improvement in combination therewith which includes the steps of:

returning to the regulation process, as a primary correction value, the value of the NO_x concentration in flue gas downstream after said catalyzer corrected via O_2-concentration in the flue gas always to influence directly the prescribed reducing agent NH_3-quantity rather than to influence the reducing agent/NO_x-stoichiometry factor;

returning to the regulation processs, as a secondary correction magnitude, the flue gas temperature ahead of said catalyzer; and

influencing the set stoichiometry factor in such a way that, while maintaining the NO_x emission limit value as the desired value of the primary correction value, said stoichiometry factor is regulated specifically via the temperature-dependent activity curve of said catalyzer.

4,681,747

PROCESS FOR THE PREPARATION OF METALLOSILICATES OF TETRAVALENT LANTHANIDE AND ACTINIDE SERIES METALS USING HETERPOLY METALLATES

Michael J. Desmond, Cleveland hts.; Janie K. Currie, Novelty, and Frederick A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 16, 1984, Ser. No. 672,594

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[4] C01B *35/10*

U.S. Cl. 423—277 **32 Claims**

1. A method for preparing a molecular sieving metallosilicate comprising the following steps:

(A) providing a mixture comprising: (1) water; (2) an oxide of silicon source; (3) a synthesis directing agent and/or mineralizing agent; and (4) a tetravalent Lanthanide or Actinide series metal containing compound which is a heteropolymetallate of the formula

$$G_f[L_gQ_pJ_rO_s].tH_2O$$

wherein

G is an ion selected from the group consisting of hydrogen, Group I-A, II-A, I-B or II-B metals, ammonium, alkyl ammonium, alkyl phosphonium or alkyl arsonium, or a mixture of two or more thereof;

L is P, As, Si, Ge, Al, H or a mixture of two or more thereof;

Q is said tetravalent Lanthanide or Actinide series metal;

J is Mo, W, V or Nb or a mixture of two or more thereof;

f is a number which when multiplied by the charge of G will result in balancing the charge of the complex within the brackets;

g is a number ranging from zero to about 20;

p is a number ranging from zero to about 20;

r is a number ranging from about 1 to about 50;

s is a number ranging from about 7 to about 150; and

t is a number ranging from zero to about 150: and

(B) maintaining said mixture at a temperature in the range of about 80° C. to about 300° C. for an effective period of time to provide said metallosilicate.

4,681,748

SUPEROXIDIZED SODIUM PERBORATE

Werner Doetsch, Bad Hoenningen, and Rudolf Siegel, Neuwied, both of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Feb. 11, 1986, Ser. No. 828,244

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505158

Int. Cl.[4] C01B *15/12*

U.S. Cl. 423—279 **9 Claims**

1. Sodium perborate with an active oxygen content of more than 16% by weight, characterized by the following characteristics of the IR spectrum (compressed KBr):

discrete bands within the range of approximately 3430, 2820, 1640, and 1060 cm^{-1};

missing individual bands at 850–870 cm^{-1}; and

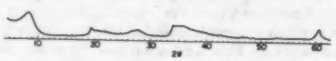
permeability ratio $D_{1060}:D_{3430}<1.0$, where D represents the permeability at the corresponding wavelength measured in percent.

4,681,749

PROCESS FOR PREPARATION OF SYNTHETIC CRYSTALLINE ZINC SILICATE MINERAL HAVING A SAUCONITE, WILLEMITE OR HEMIMORPHITE STRUCTURE

Koichi Usui, Hoya; Teiji Sato, and Masanori Tanaka, both of Shibata, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,235
Claims priority, application Japan, Jun. 22, 1984, 59-127570
Int. Cl.[4] C01B *33/20*
U.S. Cl. 423—326 13 Claims



1. A process for the preparation of a zinc silicate of the sauconite structure represented by the following formula:

$$Zn_3Si_4O_{10}(OH)_2,$$

which comprises (1) subjecting a clay mineral of the smectite group to an acid treatment to such an extent that the X-ray diffraction peak of the plane index (001) of the clay mineral substantially disappears and the Al_2O_3/SiO_2 molar ratio of the acid-treated product is within the range of from 1/11 to 1/99, and (2) subjecting the acid-treated product of the clay mineral and an oxide or hydroxide of zinc or a compound capable of forming said oxide or hydroxide under reaction conditions, to a hydrothermal treatment at a ZnO/SiO_2 molar ratio of about 3/4 at a temperature of 130° to 170° C. and a spontaneous pressure corresponding to the temperature.

4,681,750

PREPARATION OF AMORPHOUS, PRECIPITATED SILICA AND SILICEOUS FILLER-REINFORCED MICROPOROUS POLYMERIC SEPARATOR

Harlan B. Johnson, Rittman; Thomas G. Krivak, Akron, and David A. Longhini, Uniontown, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,187, Jul. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,340, Dec. 28, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,506
Int. Cl.[4] H01M *2/14;* C01B *33/12*
U.S. Cl. 423—339 64 Claims

1. In a siliceous filler-reinforced microporous polymeric battery separator, the improvement wherein the siliceous filler comprises amorphous, precipitated silica prepared by the sequential steps of:

(a) establishing an agitated aqueous solution of alkali metal silicate having (1) an initial alkali metal oxide concentration of from about 2.1 to 2.6 grams per liter and a temperature of from about 179° F. to 186° F., or (2) an initial alkali metal oxide concentration of from about 5.6 to 7.2 grams per liter and a temperature of between about 190° F. and about 198° F.,

(b) adding slowly to the said aqueous solution further alkali metal silicate in amounts of (1) from about 14.5 to about 19 times, or (2) from about 2 to about 5 times, basis the aforesaid respective initial alkali metal oxide concentration, the amount of alkali metal silicate initially present in the aqueous solution while simultaneously adding acidifying agent to the said aqueous solution in amounts sufficient to maintain the alkali metal oxide concentration in the aqueous solution at substantially its initial level, thereby to form an aqueous slurry of precipitated silica,

(c) adding additional acidifying agent to the slurry of step (b) until the pH thereof is from about 8 to about 9,

(d) ageing the slurry of step (c) at (1) between about 176° F. and 186° F., or (2) between about 188° F. and 198° F., basis the aforesaid respective initial temperatures of the initial aqueous alkali metal silicate solution, for from about 15 to 90 minutes, and thereafter

(e) adding additional acidifying agent to the slurry of step (d) in amounts such that the final solid silica product has an essentially neutral pH.

4,681,751

CATALYTIC PROCESS FOR MAKING H_2O_2 FROM HYDROGEN AND OXYGEN

Lawrence W. Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 506,893, Jun. 22, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 726,695
Int. Cl.[4] C01B *15/02*
U.S. Cl. 423—584 17 Claims

1. An improved catalytic method for making hydrogen peroxide from hydrogen and oxygen in a reaction medium at superatmospheric pressures, wherein the improvement comprises:

(i) employing an aqueous reaction medium having no organic component present in excess of about 2% by weight of the reaction medium,

(ii) employing a catalytically effective amount of Pd on adsorbent carbon, and

(iii) employing superatmospheric pressures in the range of about 200 psig to 4000 psig.

4,681,752

CAPSULES CONTAINING THE ACTIVE PRINCIPLE OF AN ALLERGEN, AND PROCESS FOR THEIR PREPARATION

Gaetano Melillo, Naples, Italy, assignor to Laboratorio Farmaceutico Lafarma S.a.S., Milan, Italy, a part interest

Continuation-in-part of Ser. No. 379,269, May 17, 1982, abandoned. This application Apr. 4, 1984, Ser. No. 597,241
Claims priority, application Italy, Jun. 4, 1981, 22136 A/81
Int. Cl.[4] A61K *9/48, 9/72, 9/44, 39/36*
U.S. Cl. 424—453 7 Claims

1. A telescoping two piece hard gelatine capsule perforated to emit powder through the holes, to be administered through insertion in an inhaler, inhaler tube or nasal spray, containing 40 mgs. per capsule of a finely subdivided freeze dry, anhydrous powder mixture whose particles are 90% smaller than 10 microns and the remainder 10% smaller than 20 microns of the active constituent of an allergen, which is a member selected from the group consisting of *Dermatophagoides pteronyssinus, Dermatophagoides farinae, Ambrosia elatior, Agrostis maritima, Agrostis stolonifera, Poa pratensis, Dactylis glomerata, Holcus lamatus, Phleum pratense, Phalaris Canariensis, Lolium perenne, Lolium multiflorum, Festuca pratensis, Festuca ovina, Cynodon dactylon* and *Agarostis alba.*, said active constituent being uniformly dispersed into at least one lactose glucose or saccharose excipient having no brochoconstrictive or irritating action on the nasal mucous membrane in a ratio of excipient to allergen between 1:1 and 50,000:1.

4,681,753

PHARMACEUTICAL COMPOSITIONS HAVING ANTINEOPLASTIC ACTIVITY

Emanuel Revici, New York, N.Y., assignor to F.C.N.s.r.l., Bergamo, Italy and Alphatime Ltd, Berkhamsted, Great Britain

Filed Mar. 2, 1984, Ser. No. 585,855
Claims priority, application Italy, Mar. 8, 1983, 19958 A/83
Int. Cl.[4] A61K *31/28*
U.S. Cl. 424—10 8 Claims

1. A pharmaceutical composition which comprises an effective amount of as the active principle, a combination of:

component (a) which is a diselenide of formula R—Se—Se—R, which is dipropyl, dipentyl, diheptyl, dinonyl or diundecyl diselenide and component (b) which is 3-heptanone, 3-pentanone or 5-nonanone, said compo-

nents (a) and (b) being present in proportions ranging from 1:10 and 1:50, respectively, and a lipophilic vehicle.

4,681,754

COUNTERACTING CYCLOSPORIN ORGAN TOXICITY

Helene Siegl, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Aug. 30, 1985, Ser. No. 771,278

Claims priority, application United Kingdom, Sep. 4, 1984, 8422253

Int. Cl.[4] A61K *31/50, 31/495, 37/00*

U.S. Cl. 424—10 **22 Claims**

1. A method of counteracting cyclosporin organ toxicity in a subject in need of such treatment which comprises adjunctly administering co-dergocrine or a pharmaceutically acceptable acid addition salt thereof to the subject in an amount effective to counteract cyclosporin organ toxicity.

4,681,755

DELIVERY DEVICE FOR ZERO-ORDER RELEASE OF AN ACTIVE PRINCIPLE INTO A DISSOLUTION FLUID AND PROCESS FOR ITS PREPARATION

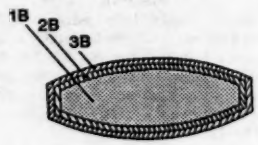
Paolo Colombo, Pavia; Ubaldo Conte, Varese, and Alberto Reiner, Como, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jul. 22, 1985, Ser. No. 757,601

Claims priority, application Italy, Jul. 26, 1984, 48632 A/84

Int. Cl.[4] A61K *9/22, 9/32*

U.S. Cl. 424—486 **16 Claims**



1. A delivery device which in the presence of a dissolution fluid releases a biologically active principle at a substantially constant rate for an extended period of time, the device comprising

(a) a reservoir comprising

(i) a solid porous matrix of homogenous polymeric material which material is insoluble and unswellable in the dissolution fluid, the geometric dimensions of which remain substantially unchanged over said period of time;

(ii) an additive which is soluble in the dissolution fluid and which has a negative heat of dissolution with respect to said fluid; and

(iii) the biologically active ingredient, said additive and biologically active ingredient being disposed in the pores of said matrix;

(b) a first homogenous and continuous coating of a film-forming polymer on said reservoir, said coating maintaining a substantially constant surface area and thickness over said period of time, said polymer being insoluble in said dissolution fluid with said coating being permeable to both said fluid and to a solution of said active ingredient in said fluid, the thickness of said first coating being such as to comply substantially with the relationship:

$$\text{thickness} = D \times S \times C_s / R$$

in which

D is the diffusion constant of said first coating;

S is the surface area of said first coating;

C_s is the saturation constant of the active principle in the dissolution fluid; and

R is the release rate; and

(c) a second homogenous and continuous coating of a a film-forming polymer material which is soluble in the dissolution fluid disposed over said first coating.

4,681,756

PREVENTION OF N-NITROSO COMPOUND FORMATION IN VIVO

William J. Mergens, West Caldwell; Harold L. Newmark, Maplewood; Prabhakar R. Sheth, Pearl River, and Jacques L. Tossounian, Pine Brook, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 744,720, Jun. 14, 1985, abandoned, which is a continuation of Ser. No. 462,290, Jan. 31, 1983, abandoned, which is a continuation of Ser. No. 258,962, Apr. 29, 1981, abandoned. This application Jun. 26, 1986, Ser. No. 880,356

Int. Cl.[4] A61K *9/22, 31/555, 31/34*

U.S. Cl. 424—451 **4 Claims**

1. A method for preventing or inhibiting the formation in vivo in the stomach of nitrosamines and nitrosamides resulting from the presence in mammals of nitrites and secondary amines, tertiary amines or secondary amides which comprises orally administering to said mammals, on a daily basis, an amount of a combination of vitamin C and vitamin E which is effective in preventing or inhibiting the formation in vivo of nitrosamines and nitrosamides, said combination being administered in the form of a controlled release, hydrodynamically balanced tablet or capsule in which the ratio of vitamin C to vitamin E ranges from about 10:1 to about 1:10.

4,681,757

DEODORANT COMPOSITIONS CONTAINING PERSIMMON JUICE AS ACTIVE INGREDIENT

Takeo Mimasu, Kyoto, and Kuniyoshi Torii, Nishinomiya, both of Japan, assignors to Rilis Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1985, Ser. No. 783,021

Claims priority, application Japan, Oct. 8, 1984, 59-210211

Int. Cl.[4] A61K *7/035, 7/032, 9/10, 31/74*

U.S. Cl. 424—47 **7 Claims**

1. A deodorant composition comprising as an active deodorant ingredient an effective deodorizing amount of persimmon juice which is pressed out from persimmon fruits and an excipient or adjuvant therefor selected from the group consisting of fumigants, aerosols, fibers, paper, granules and synthetic resins.

4,681,758

SHAPED, FLAVORED ARTICLES AND METHOD OF PRODUCING SAME

Katherine J. Fruthaler; Thomas R. Hopkins; Donald O. Hitzman; Donald H. Kubicek, and Lyle R. Kallenbach, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1986, Ser. No. 868,921

Int. Cl.[4] A23K *1/00;* **C08L** *89/00*

U.S. Cl. 424—78 **21 Claims**

1. A shaped, flavored, beefy aroma article of manufacture having a textured outer surface and a porous inner structure which comprises in the range of 5–50 wt. % of a protein-containing material and in the range of 50–95 wt. % of a polymeric material.

4,681,759

RIOPROSTIL-PVP COMPLEX

Linda S. Porubcan, Readington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed May 8, 1985, Ser. No. 731,701

Int. Cl.[4] C07C *127/00;* **A61K** *31/557, 31/79*

U.S. Cl. 424—80 **5 Claims**

1. A rioprostil: non-crosslinked polyvinylpyrrolidone com-

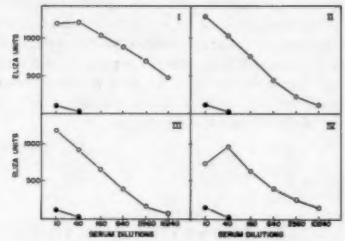
plex of 1 mole fraction of rioprostil per 2½ mole fraction of polyvinylpyrrolidone monomeric subunits in dry solid form.

4,681,760

METHOD OF CONFERRING IMMUNOTOLERANCE TO A SPECIFIC ANTIGEN

C. Garrison Fathman, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 17, 1985, Ser. No. 724,063
Int. Cl.[4] A61K *39/00, 39/35, 39/395*
U.S. Cl. 424—85 **20 Claims**



1. A method of conferring immunotolerance to a specific antigen which comprises administering to a subject in need of such tolerance, simultaneous administrations of an effective amount of said antigen and an effective amount of an antibody or derivative thereof which binds to L3T4 or its equivalent, formulated in a pharmaceutically acceptable carrier.

4,681,761

MAJOR IRON-REGULATED PROTEIN OF *NEISSERIA GONORRHOEAE* AND ITS USE AS VACCINE

Timothy A. Mietzner, and Stephen A. Morse, both of Atlanta, Ga., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University, Portland, Oreg.

Filed Oct. 24, 1985, Ser. No. 790,910
Int. Cl.[4] C07K *15/04*
U.S. Cl. 424—92 **19 Claims**

1. In an isolated, immunospecific antigenically substantially pure form suitable for use as a vaccine, the major iron-regulated protein (MIRP) of a pathogenic species of the genus Neisseria, the gonococcal congener of which protein having a molecular weight of approximately 37,000 daltons and consisting of about 340 amino acids with the profile and initial amino sequence set forth in Tables I and II of the specification.

15. In a method of producing the MIRP of a pathogenic species of the genus Neisseria which comprises the steps of:

(a) growing cells of that pathogenic species in an iron-depleted bacteriologic media;

(b) harvesting the thus-grown cells;

(c) disrupting the cells;

(d) separating the soluble portion of the cells from the insoluble portion;

the improvement which comprises

(i) selectivity solubilizing the MIRP from the insoluble portion of the disrupted cells with a cationic surfactant aqueous media; and

(ii) removing residual contaminates by chromatographic fractionation comprising cationic exchange chromatography in the presence of the cationic surfactant aqueous media; thereby isolating the MIRP in immunospecific antigenically substantially pure form.

4,681,762

GENETICALLY ATTENUATED BACTERIAL VACCINES WITH MULTIPLE MUTATIONS OF THE SAME PHENOTYPE

Max P. Oeschger, Silver Spring, Md.; Anne M. Hooke, Annandale, Va., and Joseph A. Bellanti, Bethesda, Md., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 367,008, Apr. 9, 1982, abandoned, which is a division of Ser. No. 41,896, May 23, 1979, Pat. No. 4,337,314. This application Feb. 16, 1984, Ser. No. 580,588
Int. Cl.[4] A61K *39/102, 39/02;* C12N *15/00, 1/20*
U.S. Cl. 424—92 **20 Claims**

1. A vaccine composition for the prevention of infectious diseases comprising an immunogenically-effective amount of a genetically attenuated and stable avirulent bacterial strain derived from a virulent bacterial strain by introducing into said virulent strain by genetic transfer and recombination at least two mutations of the same phenotype which renders said virulent strain avirulent, while permitting said avirulent strain to retain immunogenicity, together with an inert pharmacologically acceptable carrier.

4,681,763

COMPOSITION FOR STIMULATING BONE GROWTH

Mark A. Nathanson, Philadelphia, Pa.; A. H. Reddi, Kensington, Md., and T. K. Sampath, Arlington, Mass., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Filed Jun. 11, 1985, Ser. No. 743,598
Int. Cl.[4] A61K *35/12*
U.S. Cl. 424—95 **12 Claims**

1. A composition for implantation into animals to stimulate new bone growth comprising:

a material capable of stimulating formation of new bone and cartilage in vivo derived from demineralized bone by use of aqueous guanidine hydrochloride, said material deposited by precipitation onto a pliable physiologically acceptable support.

4,681,764

POROUS AND SPHERICAL CARBONACEOUS PRODUCT

Hiroshi Endo, Tokyo; Masao Katoh, Koshigaya, and Kuniaki Hino, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 402,029, Jul. 26, 1982, abandoned, which is a continuation of Ser. No. 205,901, Nov. 12, 1980, abandoned. This application Jul. 15, 1985, Ser. No. 755,218
Claims priority, application Japan, Nov. 22, 1979, 54-151645
Int. Cl.[4] A61K *33/44, 31/19, 31/05*
U.S. Cl. 424—125 **6 Claims**

1. A process for producing a porous and spherical carbon product having 0.30 to 1.20 meq/g of said product of acidic groups, 0.20 to 0.70 meq/g of said product of basic groups, 0.20 to 0.70 meq/g of said product of phenolic hydroxyl groups, less than 0.15 meq/g of said product of carboxyl groups, and equivalent ration of 0.40 to 2.5 of said acidic groups to said basic groups and larger than 0.60 meq/g of the value obtained by subtracting the amount of said carboxyl groups from the sum of said basic groups and said phenolic hydroxyl groups, comprising

(a) heating a porous and spherical carbon substance having a diameter of 0.05 to 1 mm, a specific pore volume of the spherical particles having a pore radius of less than 80 Å of 0.2 to 1.0 cc/g and a specific pore volume of spherical particles having a pore radius of 100 to 75000 Å of 0.1 to 1.0 cc/g, at a temperature of 350° to 700° C. in an atmosphere containing 0.5 to 20% by volume of oxygen, and

(b) heating the treated substance of step (a) at a temperature of 800° to 1000° C. in an atmosphere of a gas inert to carbon.

4,681,765

RAPID RELEASING TRIAMTERENE CONTAINING GELATIN CAPSULE DOSAGE FORMS FOR ONCE DAILY ANTIHYPERTENSIVE USE

Paul C. Guley, Clinton, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,035
Int. Cl.[4] A61K *9/22, 9/40*
U.S. Cl. 424—456 11 Claims

3. An improved rapid dispersing gelatin capsule dosage unit comprising triamterene in the presence of adjunctive disintegrant aids selected from the group consisting of sodium starch glycolate, sodium croscarmellose, and methylcellulose, wherein the improvement comprises the addition of a rapid dispersing amount of a calcium, magnesium, ammonium, aminoacid, or alkali metal nontoxic carbonate or bicarbonate salt in the absence of a surfactant.

4,681,766

COATINGS FOR CHEWING GUMS CONTAINING GUM ARABIC AND A SOLUBLE CALCIUM SALT

Robert J. Huzinec, Kenvil, and Allan H. Graff, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 7, 1986, Ser. No. 816,762
Int. Cl.[4] A23L *1/09*
U.S. Cl. 426—5 21 Claims

1. An aqueous coating syrup for use in coating chewing gums comprising:

(a) from about 30% to about 80% by weight of the coating syrup of a sweetener;

(b) from about 1% to about 15% by weight of the coating syrup of gum arabic; and

(c) from about 0.05% to about 10% by weight of the gum arabic of a water soluble calcium salt selected from the group consisting of calcium chloride, calcium bromide, calcium iodide, calcium nitrate, calcium nitrite, calcium maleate, calcium butyrate, calcium isobutyrate, calcium hypochlorite and mixtures thereof.

4,681,767

METHOD FOR DECREASING THE ALCOHOL CONTENT OF ALCOHOL-CONTAINING BEVERAGES, PARTICULARLY WINE AND SPARKLING WINE

Manfred Weiss, Kiedrich, Fed. Rep. of Germany, assignor to Henkell & Co., Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,952
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413085
Int. Cl.[4] C12G *3/08*
U.S. Cl. 426—14 10 Claims

1. In a method for decreasing the alcohol content of an initial alcoholic beverage, including the steps of subjecting the initial beverage to reverse osmosis to obtain a dealcoholized beverage and an alcohol-containing permeate by circulating the beverage to be dealcoholized in a reverse osmosis cycle with initial progressive decrease in volume of the circulating beverage within the reverse osmosis cycle, while refeeding at least aromatic substances to the dealcoholized beverage, the improvement which comprises:

(a) distilling or evaporating said alcohol-containing permeate in a vacuum to obtain substantially alcohol-free permeate water and a permeate distillate consisting essentially of alcohol,

(b) refeeding said alcohol-free permeate water to the dealcoholized beverage by adding said permeate water to the circulating beverage when the volume of the circulating beverage has reached a predetermined reduced-volume value, in amounts for maintaining said predetermined value while continuing said reverse osmosis cycle, until a predetermined amount of alcohol has been obtained as permeate distillate in step (a)

(c) adding water obtained by vacuum distillation from an additional beverage to the dealcoholized beverage, in an amount substantially equal to the amount of said permeate distillate obtained in step (a).

4,681,768

TREATMENT OF COOKING OILS AND FATS

W. Joseph Mulflur, Jeffersonville, Ind., and James R. Munson, Houston, Tex., assignors to Reagent Chemical & Research Company, Middlesex, N.J.

Filed Aug. 14, 1985, Ser. No. 765,456
Int. Cl.[4] A23D *5/02;* C09F *5/10*
U.S. Cl. 426—417 11 Claims

1. A process for treating used cooking oil or fat, comprising: contacting used cooking oil or fat with a high surface area amorphous synthetic magnesium silicate having a surface area of at least 300 sq. meters per gram, said magnesium silicate being employed in an amount effective to reduce the content of free fatty acid in the oil or fat and permit reuse of the oil or fat for cooking.

4,681,769

SPICE OLERESIN EXTRACTION PROCESS

Robert B. Bennett, III, Garden Grove, and Donald W. Wagner, Ivanhoe, both of Calif., assignors to Universal Foods Corporation, Milwaukee, Wis.

Continuation of Ser. No. 482,318, Apr. 5, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 799,295
Int. Cl.[4] A23L *1/221, 1/27*
U.S. Cl. 426—540 8 Claims

1. A process of preparing a naturally colored spice oleoresin edible oil extract with substantially no flavor elements comprising the steps of:

(a) contacting and blending fresh ground spice with a fortified edible oil extract of spice oleoresin flavor and color at ambient temperature not exceeding 100° F. and atmospheric pressure for a period of from about 15 minutes to about 24 hours to extract additional natural flavor and color elements from said fresh spice with said fortified oil;

(b) separating the further fortified spice oleoresin edible oil extract product from the once extracted solid spice residue by pressure extraction while at temperatures not exceeding 100° F.;

(c) contacting said once extracted spice residue with fresh edible oil for a period of from about 15 minutes to about 24 hours and at atmospheric pressure to extract from said extracted solid spice residue additional natural flavor and color elements to form a fortified spice oleoresin edible oil;

(d) separating the fortified spice oleoresin edible oil extract from the twice extracted solid spice residue under pressure, at ambient temperatures not exceeding 100° F.;

(e) recycling the fortified spice oleoresin edible oil for blending with fresh ground spice in the process and further enhancement of its spice oleoresin color, flavor and odor values;

(f) simultaneously discharging a stream of said spice oleoresin edible oil extract containing color and flavor components through a nozzle simultaneously with steam into a reduced pressure chamber, the amount and time of contact of said steam with the spice oleoresin oil extract being such as to not raise the temperature of said extract to a point to adversely affect the color; and

(g) recovering the liquid, colored, deflavored, edible oil extract from the chamber and discharging from said chamber the flavor elements as a gaseous vapor component.

4,681,770

FRUIT PRODUCTS CONTAINING FLAKED GRAINS

Kenneth L. Palmer, Plymouth, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 25, 1985, Ser. No. 748,381
Int. Cl.[4] A23L *1/072*
U.S. Cl. 426—615 10 Claims

1. In a food composition comprising:

A. about 4% to 30% by weight of the composition of edible plant solids, said solids selected from the group consisting of fruits, garden variety vegetables and mixtures thereof;

B. about 20% to 60% by weight of the composition of sweeteners;

C. about 9% to 18% by weight of the composition of moisture;

D. about 3% to 16% by weight of the composition of a bulking agent;

and wherein the composition is in the form of a homogeneous mass, the improvement whereby a shortened and more moist texture is provided by adding:

E. about 2% to 25% by weight of the composition of rolled cereal grains, said cereal grains having an average particle size greater than about 10 mil in thickness.

4,681,771

SWEETENER

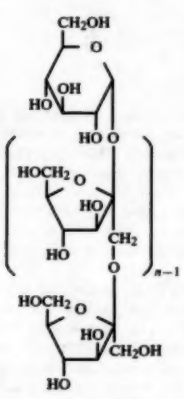
Takashi Adachi, Kanagawa, and Hidemasa Hidaka, Saitama, both of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation of Ser. No. 413,097, Aug. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 249,585, Mar. 31, 1981, abandoned. This application Oct. 15, 1985, Ser. No. 787,026
Claims priority, application Japan, Mar. 31, 1980, 55-40193; Jun. 24, 1980, 55-84547; Dec. 12, 1980, 55-174667
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—658 2 Claims

1. A sweetened low-calorific and low-cariogenic food product comprising:

(a) a low-calorific and low-cariogenic oligosaccharide sweetener; in physical admixture or in solution with

(b) an unsweetened food consumable by humans, wherein said food product is sweetened due to the presence of said oligosaccharide, and wherein said oligosaccharide comprises a sucrose molecule having covalently bound thereto, 1 to 4 fructose molecules, and is represented by general formula (I):



(I)

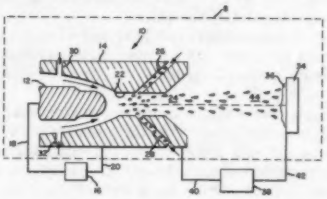
wherein n=2–5; or said oligosaccharide comprises mixtures of at least 2 of said oligosaccharides represented by formula (I).

4,681,772

METHOD OF PRODUCING EXTENDED AREA HIGH QUALITY PLASMA SPRAY DEPOSITS

John R. Rairden, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1986, Ser. No. 859,537
Int. Cl.[4] C23C *15/00*
U.S. Cl. 427—34 6 Claims



1. The method of forming a dense deposit over an extended substantially planar receiving surface

which comprises providing a low pressure plasma deposit apparatus to contain at least two plasma spray guns,

supplying a plasma spray powder material to each gun for plasma spray from said gun,

directing a first plasma gun at a first aim point on said receiving surface to deposit material processed through said first gun onto said receiving surface, directing a second plasma gun at a different aim point of said receiving surface to deposit like material processed through said second gun onto said surface

said aim points being separated by a distance greater than the distance from an aim point to a point on said receiving surface of low density deposit from either of said guns,

overlapping the deposits in the regions of low density and

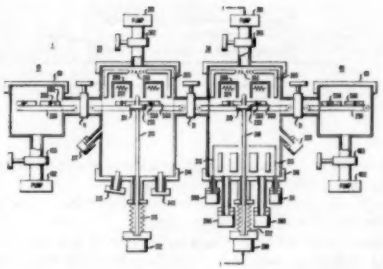
maintaining the angle of incidence of said guns to said surface substantially normal.

4,681,773

APPARATUS FOR SIMULTANEOUS MOLECULAR BEAM DEPOSITION ON A PLURALITY OF SUBSTRATES

John C. Bean, New Providence, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 509,094, Jun. 28, 1983, abandoned, which is a continuation of Ser. No. 248,568, Mar. 27, 1981, abandoned. This application Apr. 4, 1986, Ser. No. 851,291
Int. Cl.[4] C23C *14/26, 14/56*
U.S. Cl. 427—38 10 Claims



1. Apparatus for molecular beam deposition of a semiconductor material simultaneously on a plurality of substrates; said apparatus comprising:

an evacuable growth chamber and means for maintaining a pressure less than approximately 10^{-10} Torr in said evacuable growth chamber,

a molecular beam source disposed inside said evacuable growth chamber and designed for generating a molecular beam directed to a growth position inside said evacuable growth chamber,

a platen disposed at said growth position and designed for mounting a plurality of substrates essentially equidistant from a center point of said platen,

means for rotating said platen about an axis which comprises said center point and which is positioned to provide for a line-of-sight path between said molecular beam source and said growth position;

said molecular beam source being spaced from said axis a distance which is greater than the distance between said substrates and said center point, and said platen being spaced from said molecular beam source a distance which is greater than the distance between said molecular beam source and said axis.

10. Method for molecular beam deposition of a semiconductor material simultaneously on a plurality of substrates;

said method comprising: maintaining a pressure less than approximately 10^{-10} Torr in an evacuable growth chamber,

generating a molecular beam directed to a growth position inside said evacuable growth chamber,

rotating a platen which is disposed at said growth position and on which a plurality of substrates are mounted essentially equidistant from a center point of said platen, rotation being about an axis which comprises said center point and which is positioned to provide for a line-of-sight path for said molecular beam;

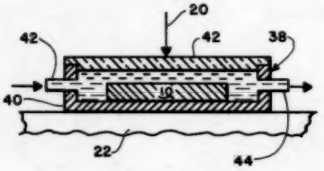
the source of said molecular beam being spaced from said axis a distance which is greater than the distance between said substrates and said center point, and said platen being spaced from said source a distance which is greater than the distance between said source and said axis.

4,681,774

LASER INDUCED SELECTIVE ELECTROLESS PLATING

Michael J. Halliwell, 4435 Willow Mist Dr., Dayton, Ohio 45424, and Joseph Zahavi, c/o Technion Research & Development Foundation, Ltd., Israel Institute of Metals, Haifa, Technion City, Israel

Filed Jan. 17, 1986, Ser. No. 819,558
Int. Cl.[4] C23C *18/28*
U.S. Cl. 427—53.1 **20 Claims**



1. A method for selectively plating a metal onto a workpiece which consists essentially of the steps of

(a) applying a sensitizing solution to said workpiece, thereby providing a sensitized workpiece,

(b) describing a pattern on said workpiece by flash evaporating sensitizer from said workpiece by directing a laser beam onto the thus-sensitized workpiece in an area which is not to receive said metal plated thereon, and

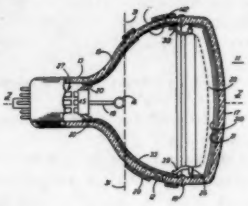
(c) contacting said workpiece with an electroless plating solution to achieve plating in areas wherein said sensitizer remains.

4,681,775

CRT WITH OPTICAL WINDOW AND METHOD

Anthony V. Gallaro, Auburn, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Division of Ser. No. 448,468, Dec. 10, 1982, Pat. No. 4,528,477. This application Mar. 13, 1985, Ser. No. 712,319
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—64 **4 Claims**



1. A method for producing an adherent, electrically conductive transparent metal oxide layer on a defined area of the interior surface of the funnel wall of a cathode ray tube, the method comprising:

(a) applying a layer of a metallo-organic formulation to the defined area, said formulation comprising a mixture of tin resinate, antimony resinate and solvent; and

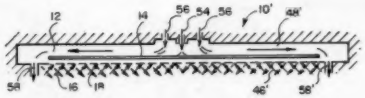
(b) heating the layer to substantially completely pyrolyze the layer to a metal oxide layer, which is transparent, adherent and conductive.

4,681,776

IMPROVED METHOD FOR DOUBLE FLOATING TRANSPORT AND PROCESSING OF WAFERS

Edward Bok, Dr Badhoevedorp, Netherlands, assignor to Integrated Automation Limited, Badhoevedorp, Netherlands

PCT No. PCT/NL85/00021, § 371 Date Jan. 28, 1986 § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05757, PCT Pub. Date Dec. 19, 1985
PCT filed Jun. 3, 1985, Ser. No. 823,419
Claims priority, application Netherlands, Jun. 4, 1984, 8401776
Int. Cl.[4] B08B *5/04*; B44C *1/22*; B05D *5/12*; C23C *13/08*
U.S. Cl. 427—85 **26 Claims**



1. Method of double floating transporting and processing wafers within a confined passageway comprising:

a. supplying a fluid medium through a plurality of supply channels intersecting the passageway and,

b. discharging said fluid medium through a plurality of discharge channels intersecting such passageway adjacent said supply channels, such that moving fluid medium cushions while transporting the wafer within said passageway; and

c. selectively rotating said wafer within said passageway by flowing pressurized fluid medium across the planar surface of said wafer and in the desired direction of rotation.

4. Method of transporting and processing wafers within a confined passageway as in claim 1, including during said rotating of said wafer, simultaneously supplying said fluid medium towards both planar sides of said wafer.

12. Method of transporting and processing wafers within a confined passageway as in claim 4, wherein said rotating of

said wafer is at least temporarily effected by continuously supplying pressurized fluid medium in configuration as a rotating radial segment extending across the planar surface of the wafer.

18. Method of transporting and processing wafers within a confined passageway as in claim 12, including temporarily securing said wafer by suction during said rotating.

20. Method of transporting and processing wafers within a confined passage way as in claim 18, wherein said processing includes directing coating agent onto said wafer.

4,681,777

METHOD FOR ELECTROLESS AND VAPOR DEPOSITION OF THIN FILMS OF THREE TIN SULFIDE PHASES ON CONDUCTIVE AND NONCONDUCTIVE SUBSTRATES

Robert D. Engelken, 304 Easy St., and Hal E. McCloud, 2011 Emerald St., both of Jonesboro, Ark. 72401

Filed May 5, 1986, Ser. No. 859,927
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—87 22 Claims

1. A process for the electroless and chemical vapor deposition of tin sulfide on a conductive or nonconductive substrate comprising the steps of:

a. Preparing a chemical bath solution comprising a stannous salt, elemental yellow sulfur, and an organic acid;

b. Heating said solution, and then either removing or maintaining the heat source; and

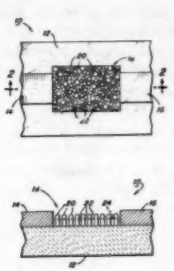
c. Placing said substrate within or above said solution to form on said substrate a Sn_xS ($0.5 \leqq x \leqq 1$) film.

4,681,778

METHOD AND APPARATUS FOR MAKING ELECTRICAL CONNECTIONS UTILIZING A DIELECTRIC-LIKE METAL FILM

Peter L. Young, South Barrington, Ill., assignor to Optical Materials, Inc., Mercer Island, Wash.

Filed Nov. 14, 1985, Ser. No. 799,926
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—96 9 Claims



1. A method for electrically connecting conductors on a substrate comprising,

depositing an electrically non-conducting film containing a plurality of non-contacting microscopic conductive metal columns or islands on the substrate interconnecting the conductors to be electrically connected, and locally heating the film interconnecting the conductors to melt the columns or islands so that the metal forming the columns or islands flows together to render the film between the conductors conductive.

4,681,779

ANTI-STATIC STYRENE POLYMER PARTICLES BY IMPREGNATION

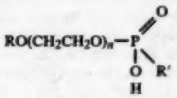
Alvin R. Ingram, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1985, Ser. No. 791,479
Int. Cl.[4] B05D 7/00; C12P 33/14
U.S. Cl. 427—222 5 Claims

1. Method of making foamable styrene polymer particles which exhibit anti-lumping properties and anti-static properties during pre-expansion comprising the steps of:

(a) suspending styrene polymer particles in water with the aid of a suspending agent system selected from tricalcium phosphate, calcium hydroxide or calcium carbonate;

(b) adding 3 to 20 weight percent of a blowing agent and 0.1 to 0.4 weight percent of a mixture of phosphate esters having general formula



wherein R may be alkaryl groups, branched alkyl groups having at least 7 carbon atoms, or normal alkyl groups having at least 10 carbon atoms; n may be a positive integer of from 1 to 33; and R′ may be $RO(CH_2CH_2O)_n$— or hydroxyl group; said suspending agent being used in a ratio of agent to phosphate esters of between 3 and 10;

(c) heating the suspension at a temperature of from 80° to 150° C. to impegnate the polymer particles with blowing agent and coat the particles with phosphate esters;

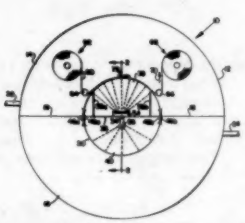
(d) cooling the suspension to room temperature, acidifying the suspension, and separating the impregnated and coated particles from the aqueous system.

4,681,780

CONTINUOUSLY CLEANED ROTARY COATING MASK

Daniel T. Kamman, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 1, 1983, Ser. No. 556,962
Int. Cl.[4] B05D 5/00, 1/32; C23C 14/04
U.S. Cl. 427—282 10 Claims



1. Apparatus for continually depositing coating materials on a moving web in a precise well-defined pattern, comprising:

means for defining at least two separate enclosed chambers, with each of said chambers being capable of supporting a partial vacuum therein and with said chambers being generally isolated from each other;

a pattern defining, movably mounted mask having pattern-forming openings therein, said mask being alternately movable between internal portions of said chambers;

means for moving a surface of said web into pattern opening covering intimate contact with said movably mounted mask for movement therewith and for moving said mask between said internal chamber portions;

means within one of said chambers for applying coating

materials to the said pattern defining openings formed in said movably mounted mask and to a web surface presented thereat; and

means within another of said chambers for cleaning coating materials from the pattern defining mask surfaces adjacent said pattern mask openings.

9. A method for continually depositing coating materials on a moving web, comprising the steps of:

providing at least two separate enclosed chambers with each of said chambers being capable of supporting a partial vacuum and with said chambers being generally isolated from one another;

providing a pattern defining movably mounted mask having pattern-forming openings therein with portions of said mask being alternately movable between said enclosed chambers;

moving a surface of said web into pattern opening covering intimate contact with said movably mounted mask for movement therewith while simultaneously moving said mask portions between said internal chamber portions;

providing means within one of said enclosed chambers for applying coating materials to the said pattern defining openings formed in said movably mounted mask and to a web surface presented thereat; and

providing means within another of said chambers for cleaning coating materials from the pattern defining mask surfaces adjacent said pattern mask openings.

4,681,781

SHIPPING BAG

Charles R. Murray, Toronto, and Ray E. Harrison, Brampton, both of Canada, assignors to C-I-L Inc., North York, Canada

Continuation of Ser. No. 631,540, Jul. 16, 1984, Pat. No. 4,576,844. This application Feb. 19, 1986, Ser. No. 830,858

Claims priority, application Canada, Nov. 28, 1983, 442097; Apr. 2, 1984, 451106

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] B65D *30/08;* **B32B** *27/08*

U.S. Cl. 428—35 **20 Claims**

1. A thermoplastic shipping bag comprising a front wall and a back wall heat sealed thereto, each of said walls comprising a cross-laminated outer ply comprising at least two sheets of uni-axially oriented polyethylene bonded together, and heat sealed thereto, an inner wall formed of low density polyethylene, said inner wall comprising a distinct inner ply.

4,681,782

ARTICLE FOR DETERMINING THE PRESENCE OF IMMUNE COMPLEXES

Adil N. Ozkan, Salt Lake City, Utah, assignor to Biostar Medical Products, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 363,967, Mar. 31, 1982, Pat. No. 4,450,231. This application Oct. 3, 1983, Ser. No. 538,493

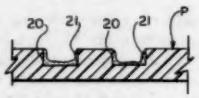
Int. Cl.[4] G01N *33/536, 33/539*

U.S. Cl. 428—36 **4 Claims**

1. An article for use in performing an immunoassay on a specimen to determine the presence or composition of immune complexes, comprising:

a solid phase base containing a surface capable of receiving a coating layer thereon; and

a coating layer received on said surface, said layer consisting of a non-proteinaceous, non-ionic polymer selected from the group consisting of polyethylene glycol, dextran, polyvinyl chloride, and mixtures thereof, which is adhered to said surface and capable of absorbing immune



complexes which may be present in fluid specimens contacted with said surface.

4,681,783

TUBULAR LINING MATERIAL FOR PIPE LINES

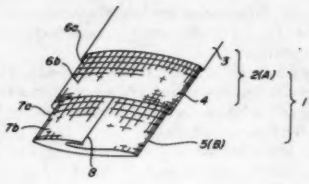
Masakatsu Hyodo, and Isaburo Yagi, both of Osaka, Japan, assignors to Ashimori Industry Co., Ltd., Japan

Filed Dec. 17, 1985, Ser. No. 809,865

Claims priority, application Japan, Dec. 18, 1984, 59-265271

Int. Cl.[4] F16L *35/16*

U.S. Cl. 428—36 **10 Claims**



1. A tubular lining material for reinforcing pipe lines, utilizable in a pipe-lining method wherein the tubular lining material, having a binder disposed on the inner surface thereof, is inserted into a pipe line and is allowed to advance within the pipe line as the tubular lining material is turned inside out under fluid pressure whereby the tubular lining material is applied to the inner surface of the pipe line with the binder being interposed between the pipe line and the tubular lining material, said tubular lining material comprising an air-impervious outer tubular jacket coated with an air-impervious outer layer of a synthetic resin and provided on the inside thereof with a reinforcing inner tubular textile jacket, characterized in that the inner reinforcing tubular textile jacket is more coarse in weaving density and larger in diameter than the outer air-impervious tubular textile jacket but has a folded over portion to permit it to fit within said outer textile jacket wherein the product of the length of the diameter and the elongation ratio in the direction of the diameter, on fracture, of the air-impervious outer tubular textile jacket is approximately equal to the product of the length of the diameter and the elongation ratio in the direction of the diameter, on fracture of the reinforcing inner tubular textile jacket.

4,681,784

LIGHTSAFE MASKING FILM

Ryohei Ebara, and Shin-ichi Sano, both of Saitama, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Jan. 17, 1986, Ser. No. 819,661

Claims priority, application Japan, Jan. 18, 1985, 60-5660

Int. Cl.[4] B32B *7/06, 7/12*

U.S. Cl. 428—40 **6 Claims**

1. A lightsafe masking film which comprises a substrate of plastic film, a pressure sensitive adhesive layer formed thereon, and a lightsafe peelable layer formed on said adhesive layer, comprising (a) nitrile rubber, (b) nitrocellulose, (c) an epoxy compound as a tackiness improver, and (d) a lightsafe colorant.

4,681,785

SUPPLY ROLL FOR PROTECTIVE COVERS ESPECIALLY THOSE MADE OUT OF SHEET PLASTIC, FOR MOTOR-VEHICLE SEATS

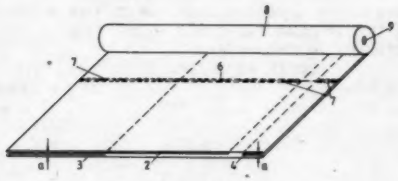
Stephanie Horn, Schwalmstadt-Treysa, Fed. Rep. of Germany, assignor to Horn-Plastik Theodor Horn KG, Schwalmstadt, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,169

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500928

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—43 2 Claims



1. A supply roll of protective covers made from sheet plastic for motor-vehicle seats comprising: covers attached to each other across their length in a long web and folded over at their ends to form pockets with a seam that can be pulled out over a backrest or forward edge of a seat; said seam comprising perforations between said covers for separating said covers from each other; said web having a length and width and being folded longitudinally to form a longitudinal fold between the pockets in said covers and said web being finally wound into a supply roll; and a supporting fold for holding constant the winding density of the supply roll of wound seat covers over its whole width, said supporting fold comprising additional folds of said cover and being located along the length of the web at the longitudinal fold.

4,681,786

COVERINGS PROVIDING IMPACT SOUND ISOLATION

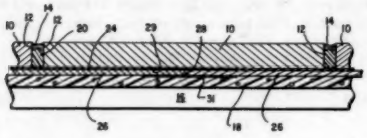
John G. Brown, 20205 State Line Rd., Harvard, Ill. 60033

Continuation of Ser. No. 131,516, Mar. 18, 1980, abandoned. This application Jan. 3, 1984, Ser. No. 567,151

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] B32B *3/10*; E04F *13/08*

U.S. Cl. 428—44 20 Claims



1. Impact sound isolation of a gravity-held-inplace-horizontal-tile-array of jobsite-installed tiles, comprising, in combination, a horzontal-base-surface, a horizontal-disassociation-cushioning-layer loose laid over said horizontal-base-surface, one or more slip sheets, and a plurality of horizontal-individual-tiles of uniform thickness having a top wearing surface, a bottom surface and three or more sides loose laid and overlying said one or more slip sheets, said tiles being arranged in a patterned layout, joined to one another by means of a dynamic-interactivefluidtight-flexible-joint, and held in place by gravity, friction and accumulated-interactive-assemblage over said horizontal-disassociation-cushioning-layer and said one or more slip sheets so that the assembly is cushioned by said horizontal-disassociation-cushioning-layer and responds dynamically, interactively and accommodatively to foot and rolling traffic, said dynamic-interactive-fluidtightflexible-joint comprising an elastomeric sealant, said impact sound isolation achieved by means of the placement of said horizontal-disassociation-cushioning-layer between the hard top surface of said horizontal-base-surface and the hard bottom surface of said horizontal-individual-tiles and by means of the resilient, dynamic system of said dynamiciterative-fluidtight-flexible-joint joining said tiles together.

4,681,787

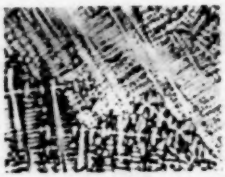
INGOT PRODUCED BY A CONTINUOUS CASTING METHOD

Charles D'A. Hunt, Occidental, Calif., assignor to Degussa Electronics Inc., Morgan Hill, Calif.

Division of Ser. No. 656,151, Sep. 28, 1984, Pat. No. 4,583,580. This application Nov. 15, 1985, Ser. No. 798,596

Int. Cl.[4] B22D *11/00, 27/02*

U.S. Cl. 428—577 6 Claims



1. A continuously cast ingot of a reactive alloy having a substantial liquidus-solidus temperature difference and a high melting point, said ingot being characterized by a macrostructure in excess of about one millimeter average grain dimensions with a non-uniform shape, orientation and distribution, and being characterized by a microstructure substantially consisting of dendritic crystallites of the order of 500 microns cross sectional size and of the order of 50 microns cell spacing.

4,681,788

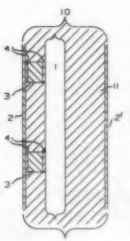
INSULATION FORMED OF PRECIPITATED SILICA AND FLY ASH

Robert W. Barito, and Kenneth L. Downs, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 31, 1986, Ser. No. 891,157

Int. Cl.[4] B32B *1/00, 1/10*; B65B *31/00*; E04B *1/74*

U.S. Cl. 428—68 19 Claims



1. A slab of board-like material for use as a thermal insulation comprising:

a. a precipitated silica and a fly ash material, there being between 30% and 70% of said fly ash material based upon the total weight of said precipitated silica and fly ash material; and

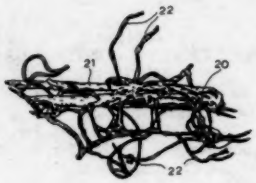
b. a gas and water tight envelope containing said mixture of precipitated silica and fly ash material.

4,681,789

THERMAL INSULATOR COMPRISED OF SPLIT AND OPENED FIBERS AND METHOD FOR MAKING SAME

James G. Donovan, Norwell, and John Skelton, Sharon, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,389
Int. Cl.[4] B32B 3/02
U.S. Cl. 428—93 6 Claims



1. A synthetic fiber batt thermal insulator material comprising an assembly of individual parent fibers which have diameters in the range of from 9 to 25 microns and provide support for a network of many fibrils, said fibrils having been split away or fibrillated from individual parent fibers and being small in cross-sectional dimension relative to the parent fibers, said batt having the following characteristics:

a density of less than 1.0, typically about 0.5 lb/cu ft;

an apparent thermal conductivity measured by the plate-to-plate method according to ASTM C518 with heat flow down of less than 0.5 Btu-in/hr-ft^2-°F.;

in the dry state, under a compressive stress of 5 lb/square inch, a compressive strain of at least 90% and a long-term compressive recovery of at least 85% after removal of this stress as determined by the test method of Section 4.3.2 of U.S. Military Specification MIL-B-41826E modified by use of a lower pressure at which initial thickness and recovered-to-thickness are measured;

zero gauge length condition: 4.02 g sample; 2.00 inches; 0.3 lb/ft^3; nominally zero load.

4,681,790

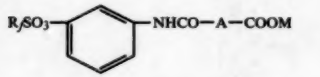
TREATING COMPOSITION CONTAINING FLUOROCHEMICAL COMPOUND MIXTURE AND TEXTILES TREATED THEREWITH

James J. Fong, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1986, Ser. No. 825,530
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—96 19 Claims

13. A substrate treated with a composition comprising a blend of

(a) a compound having the formula



where

R_f is a fluorinated aliphatic radical;

A is a divalent radical group obtained by eliminating the carbonyl groups of a dibasic organic acid or an organic anhydride selected from the group consisting of tetrachloro phthalic, tetrabromo phthalic and chlorendic; and

M is a cation selected from the group consisting of NH_4^+, Na^+, K^+, Li^+, H^+, or a protonated alkyl amine having from 1–6 carbon atoms in the alkyl group;

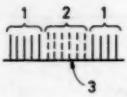
(b) a normally liquid or low melting solid, water soluble or dispersible, fluoroaliphatic radical-containing poly(oxyalkylene) compound, or composition comprising a mixture of such poly(oxyalkylene) compounds, said poly(oxyalkylene) compound having one or more of said fluoroaliphatic radicals and one or more poly(oxyalkylene) moieties, said fluoroaliphatic radicals and poly(oxyalkylene) moieties being bonded together by hetero atom-containing groups or organic linking groups or combinations of said groups.

4,681,791

THERMOCHROMIC TEXTILE MATERIAL

Yutaka Shibahashi; Norikazu Nakasuji; Takashi Kataoka; Hiroshi Inagaki, all of Aichi; Tutomu Kito, Gifu; Masaharu Ozaki, Aichi; Nobuaki Matunami, Gifu; Naoya Ishimura, and Katuyuki Fujita, both of Aichi, all of Japan, assignors to Pilot Ink Co., Ltd., Aichi, Japan

Filed Jan. 30, 1986, Ser. No. 824,039
Claims priority, application Japan, Jan. 30, 1985, 60-15738; Feb. 5, 1985, 60-20244; Feb. 6, 1985, 60-21547; Feb. 27, 1985, 60-38293; Mar. 29, 1985, 60-68129
Int. Cl.[4] C09D 11/06, 11/12
U.S. Cl. 428—96 10 Claims



1. A thermochromic textile materaial comprising a textile material composed of a plurality of fibers coated with a thermochromic layer containing a binder and a thermochromic pigment comprising an electron-donative, color former, an electron-accepting developer and a color-changeable controlling agent, wherein each of the fibers is coated with the thermochromic layer containing the thermochromic pigment having a particle size satisfying the formula:

$$0.01 \leqq r \leqq 10\sqrt{D/d}$$

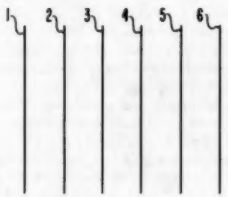
wherein r represents the particle size of the pigment in μm; D represents the fineness of the fiber in denier; and d represents the density of the fibers in g/cm^3, in which said thermochromic layer is coated to a coverage of from 3 to 90% by weight based on the fibers on a dry basis, and said composition is present in an amount of from 5 to 80% by weight based on the thermochromic layer on a dry basis.

4,681,792

MULTI-LAYERED FLEXIBLE FIBER-CONTAINING ARTICLES

Gary A. Harpell, Morristown; Igor Palley, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 9, 1985, Ser. No. 825,037
Int. Cl.[4] B32B 3/06
U.S. Cl. 428—102 47 Claims



1. An article of manufacture comprising a plurality of first flexible layers arranged in a first portion of said article each of said first flexible layers consisting essentially of uncoated fibers comprising fiber selected from the group of polyolefin fibers,

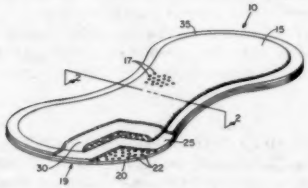
polyvinyl alcohol fibers and polyacrylonitrile fibers having a tensile modulus of at least 300 g/denier and a tenacity of at least about 15 g/denier and a plurality of second flexible layers arranged in a second portion of said article, each of said second flexible layers consisting essentially of uncoated fibers, the resistance to displacement of fibers in each of said second flexible layers being greater than the resistance to displacement of fibers in each of said first flexible layers.

4,681,793

NON-OCCLUDING, LIQUID-IMPERVIOUS, COMPOSITE BACKSHEET FOR ABSORPTIVE DEVICES

E. Kelly Linman; John J. Curro, and Eugene Weinshenker, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 31, 1985, Ser. No. 740,084
Int. Cl.⁴ B32B *3/10*
U.S. Cl. 428—138 **18 Claims**



1. A composite backsheet for use adjacent an absorbent device, said backsheet comprising:

(a) a first innermost substantially liquid-impervious layer juxtaposed adjacent said absorbent device, said liquid-impervious layer being soft and compliant, whereby it is resistant to noise under conditions of movement relative to the wearer's body; and

(b) a second outermost layer comprising a liquid-pervious polymeric film secured in superposed relation adjacent said innermost layer, said polymeric film exhibiting a multiplicity of resilient protuberances across its exposed surface, each protuberance originating in a plane adjacent said innermost layer and protruding outwardly, each protuberance terminating to form a volcano-like aperture at its apex, each of said volcano-like apertures exhibiting a multiplicity of outwardly oriented cusps which contact the wearer's skin in use to prevent said polymeric film from sticking to the wearer's skin, said protuberances further permitting air circulation between said innermost layer and said outermost layer, whereby the wearer's skin remains substantially non-occluded by said composite backsheet at points of contact between said backsheet and the wearer's skin.

4,681,794

ADHESIVE CONNECTION BETWEEN THE MARGINAL AREA OF A GLASS PANE AND A WINDOW FRAME

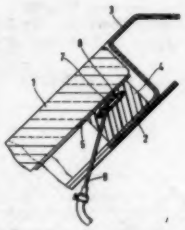
Heinz Kunert, Cologne, Fed. Rep. of Germany; Luc Vanaschen, Eupen, Belgium, and Gerd Cornils, Merzenich-Girbelsrath, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Paris, France

Filed Jan. 6, 1986, Ser. No. 816,440
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500205
Int. Cl.⁴ B32B *3/20*
U.S. Cl. 428—188 **20 Claims**

1. An adhesive connection between the marginal area of a glass pane and a window frame, comprising:

an adhesive bead of adhesive material adhered to said glass pane and said window frame at said marginal area, said bead lacking flanges for gripping said glass pane from two sides; and

means defining a fluid pressure tight hollow space completely enclosed within said adhesive bead, whereby pressurized fluid may be introduced into said hollow space for separating said glass pane from said window frame.

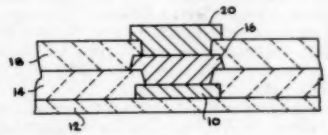


4,681,795

PLANARIZATION OF METAL FILMS FOR MULTILEVEL INTERCONNECTS

David B. Tuckerman, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 748,375, Jun. 24, 1985. This application Aug. 23, 1985, Ser. No. 768,590
Int. Cl.⁴ B32B *3/00*; H01L *21/00, 21/04*; B05D *3/06*
U.S. Cl. 428—209 **20 Claims**



18. An electrical interconnection structure comprising a plurality of aluminum or aluminum-silicon alloy layers separated by dielectric layers, each aluminum or alloy layer having been planarized to form a flat surface by eliminating any oxide coating of the aluminum or alloy, forming a passivating and antireflection coating of silicon on the aluminum or alloy, and heating to momentarily melt the layer to form a flat surface prior to the formation of an additional dielectric layer, the metal layers having been patterned after planarization according to a preselected pattern and interconnected through the dielectric layers.

4,681,796

THERMAL TRANSFER RECORDING MEDIUM

Tatsuichi Maehashi, Hachioji; Takao Abe, Tokyo; Kunihiro Koshizuka, Hino, and Yoshihiro Inaba, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,408
Claims priority, application Japan, Sep. 28, 1984, 59-202064
Int. Cl.⁴ B41M *5/26*
U.S. Cl. 428—212 **17 Claims**

1. A thermal transfer recording medium having a support and at least one heat fusible coloring agent layer superposed on said support, said heat fusible coloring agent layer comprising at least one coloring agent, at least one heat fusible substance and at least one polymer, wherein the concentration of said polymer in said heat fusible coloring agent layer varies over said layer with the highest concentration thereof being present in the portion of said layer most nearly adjacent said support.

4,681,797

THERMOFORMABLE, MULTI-LAYER PLASTIC SHEET HAVING GAS BARRIER PROPERTIES

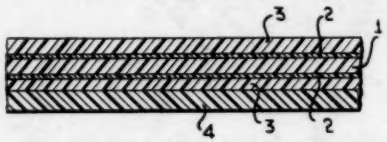
Augustinus E. M. Van Isegbem, St-Niklaas, Belgium, assignor to Cobelplast N.V.S.A., Lokeren, Belgium

Filed Sep. 19, 1985, Ser. No. 777,797

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435233

Int. Cl.[4] B32B 7/02

U.S. Cl. 428—212 7 Claims



1. A thermoformable, multi-layer plastic sheet having gas barrier properties, the sheet comprising an inner extrudable gas barrier layer, a glue layer applied to either side of the gas barrier layer, each of the glue layers having layers of a first polyolefin composition bonded to it and at least one of the two first polyolefin layers being bonded to a second polyolfin layer which has a lower melt index than the layer of the first polyolefin composition underneath.

4,681,798

FIBROUS MAT FACER WITH IMPROVED STRIKE-THROUGH RESISTANCE

Frederick A. Gill, and Mario P. Tocci, both of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Continuation of Ser. No. 685,699, Dec. 24, 1984, Pat. No. 4,637,951. This application Nov. 3, 1986, Ser. No. 926,155

Int. Cl.[4] B32B 5/24, 17/10; D04H 3/12

U.S. Cl. 428—215 6 Claims

1. A porous, non-woven fabric mat for use as a facer, substrate, or carrier for receiving a curable substance while in the fluid state, said mat comprising a blend of dispersed, substantially randomly oriented fibers and a binder for holding said blend of fibers together;

said blend of fibers comprising microfibers intermixed with base fibers, said microfibers comprising at least two percent (2%) of the total weight of said blend, said base fibers having a mean diameter of between about eight (8) microns and about twenty-five (25) microns;

said binder comprising a water miscible combination of a heat settable binder resin and an effective amount of a wet proofing polymer resin compatible with said heat settable binder resin, said wet proofing polymer being selected from a group consisting of water based silicone elastomer and a fluorochemical emulsion.

4,681,799

ULTRATHIN POLYMERIC IMINE FILMS AND PROCESS FOR MAKING THE SAME

Alan K. Engel, Tokyo, Japan, assignor to Research Development Corp. of Japan, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,497

Claims priority, application Japan, Nov. 1, 1984, 59-229003

Int. Cl.[4] B05D 7/00; C08G 12/04

U.S. Cl. 428—220 11 Claims

1. An ultrathin film comprising a polymeric imine which comprises the repeat unit

$$\{CHRCH{=}NR'N\}$$

in which R is aromatic, heteroaromatic, olefinic, acetylenic, or a mixture of these, and R' is aromatic, heteroaromatic, olefinic, acetylenic, or a mixture of these, said film comprising at least one unit layer, each said unit layer having a thickness less than 20 nanometers.

4,681,800

IMPREGNATED, SOFT, FLAT GASKET AND MANUFACTURING METHOD

Hans-Rainer Zerfass, Burscheid, and Franz-Josef Giesen, Odenthal, both of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 819,729

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501361; Jun. 13, 1985, 3521138

Int. Cl.[4] B32B 5/16

U.S. Cl. 428—283 25 Claims

1. In an impregnated soft, flat sealing gasket, including a fiber mat and a silicone impregnating agent; the improvement wherein the silicone impregnating agent includes a cross-linking agent which forms radicals under the influence of heat and the silicone impregnating agent has been at least partly cross-linked thereby, and wherein the silicone impregnating agent has been cross-linked in at least one surface region of said flat sealing gasket under the influence of high energy radiation to a greater degree than obtainable by thermal treatment alone.

4,681,801

DURABLE MELT-BLOWN FIBROUS SHEET MATERIAL

Gilbert Eian, Mahtomedi, and Paul G. Cheney, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1986, Ser. No. 899,522

Int. Cl.[4] B32B 5/16

U.S. Cl. 428—283 35 Claims

1. A durable melt-blown fibrous sheet material comprising:

(a) a coherent layer of melt-blown organic polymeric fibers, and

(b) a plurality of organic polymeric reinforcing fibers extending transversely through the layer of melt-blown fibers and being held in that position by bonding to fibers on the opposing faces of the layer of melt-blown fibers.

4,681,802

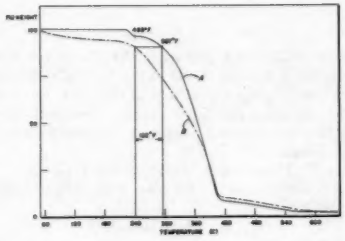
TREATED GLASS FIBERS AND AQUEOUS DISPERSION AND NONWOVEN MAT OF THE GLASS FIBERS

Peter C. Gan, Pittsburgh, Pa.; Jerry C. Hedden, Shelby, N.C., and Narasimhan Raghupathi, Murrysville, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 658,009, Oct. 5, 1984, Pat. No. 4,592,956. This application Feb. 28, 1986, Ser. No. 834,990

Int. Cl.[4] C04B 35/80; D04H 1/58

U.S. Cl. 428—288 6 Claims



1. Aqueous dispersion of chopped glass fiber strands having a length of about 1/16 of an inch to about 3 inches and having an aqueous treating composition comprising:

(a) one or more cationic surfactants having one or more primary, secondary, or tertiary amine moieties in an

amount of about 0.01 to about 10 weight percent of said aqueous chemical treating composition,

(b) one or more water soluble, poly(oxyalkylene-oxyethylene) copolymers having a ratio of the total amount of ethylene oxide to the total amount of hydrophobic alkylene oxide in the range of around 99/1 to around 78/22 and a molecular weight of around at least 15,000 in an effective amount to provide sufficient protection to the glass fibers,

(c) one or more polar functional coupling agents in an amount of about 0.01 to about 2 weight percent of said aqueous chemical treating composition, and

(d) water in an amount to give a solids content that is effective for applying said composition to glass fibers, where the strands are present in an amount of about 0.001 to about 5 weight percent of the dispersion.

6. Nonwoven, sheet-like mat made from the dispersion of claim 1, wherein an amount of water has been removed and a polymeric binder has been applied and the mat cured, wherein the binder is selected from the group consisting of urea formaldehyde, phenol formaldehyde, melamine formaldehyde, epichlorohydrin and amino resins and anionic or cationic modified derivatives thereof.

4,681,803

PIGMENTED, HEAT-SEALABLE COATING COMPOSITION FOR APPLICATION TO ORIENTED POLYOLEFIN FILMS

Leland L. Liu, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,284

Int. Cl.[4] C09J *7/02*; B32B *9/04, 27/08*

U.S. Cl. 428—348 **10 Claims**

1. A pigmented heat-sealable coating composition for application to a primer-coated, oriented mono-layer or multi-layer polyolefin film which comprises a blend of (a) a binding and oxygen barrier heat-sealable polyvinylidene chloride homopolymer and/or polyvinylidene chloride copolymer, at a level of from about 50 to about 90 weight percent of the coating composition, containing at least about 50 weight percent copolymerized vinylidene chloride, (b) wax at a level of from about 1.5 to about 10 weight percent of the coating composition, to thereby result in a significant reduction in the coefficient of friction of a film to which the coating composition is applied and (c) pigment at a level of from about 15 to about 25 weight percent of the coating composition.

2. A mono-layer or multi-layer oriented polyolefin film having at least one exposed surface thereof coated with a primer, said primer-coated surface being coated with a coating composition of claim 1.

4,681,804

POLYBUTYLENE ROOM TEMPERATURE AGED FILM

Charles C. Hwo, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1985, Ser. No. 770,912

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—349 **10 Claims**

1. A room temperature aged cast polymer film having good hot tack, a low heat sealing temperature and high clarity comprising:

a polypropylene or polypropylene-based copolymer or blend as a substrate or core layer; and

a polymer blend as a surface layer, wherein said polymer blend comprises a butene-1 propylene copolymer having a propylene content of from about 10% by weight to about 25% by weight.

4,681,805

STRANDS OF CHEMICALLY TREATED GLASS FIBERS HAVING A REDUCED TENDENCY TO GIVE GUMMING DEPOSITS

Garry D. Puckett, Salisbury, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1985, Ser. No. 812,038

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—391 **17 Claims**

1. Strands of chemically treated glass fibers, wherein the glass fibers have a moisture-reduced residue of an aqueous starch-oil chemical treatment, the improvement comprising:

poly(oxypropylene) organic alcohol selected from the group consisting of poly(oxypropylene) glycol and poly(oxypropylene) polyol that is liquid and water soluble and that is essentially free of ethylene oxide groups being present in the moisture-reduced residue as the sole starch film-former modifier.

4,681,806

PARTICLES CONTAINING RELEASABLE FILL MATERIAL AND METHOD OF MAKING SAME

Josef Matkan, Malvern, and Richard J. Treleaven, Toorak Gardens, both of Australia, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1986, Ser. No. 829,005

Int. Cl.[4] A01N *25/28*; B01J *13/02*; C08G *18/82*

U.S. Cl. 428—402.21 **12 Claims**

1. Method of preparing a spherical particle comprising:

(1) admixing a releasable fill material, an isocyanate, and a matrix-forming co-reactant to form a mixture,

(2) emulsifying said mixture in an aqueous medium containing a nonreactive emulsifying agent to provide a dispersion of spheres of said mixture,

(3) hydrolyzing a first portion of the isocyanate near the surfaces of said spheres by contact with water in the aqueous medium to initiate formation of polyurea (a) at the surfaces of said spheres as a thin, substantially continuous layer and (b) in the interiors of the spheres as a continuum for some distance beneath the surfaces of said spheres, said continuum being a polyurea matrix, and reacting a second portion of the isocyanate within said spheres with said matrix-forming co-reactant to form additional matrix material in the interiors of said spheres.

8. A spherical particle comprising a thin, substantially continuous surface layer of polyurea, surrounding an interior portion comprising a matrix comprising polyurea, said matrix having releasable fill material contained therein, wherein said polyurea matrix forms a continuum extending from said continuous polyurea surface layer into the interior of said particle.

4,681,807

GRAY BODY COLORED ZINC SULFIDE ACTIVATED WITH COPPER

Harry O. Schulze, Wyalusing, and Ronald E. Karam, Towanda, both of Pa., assignors to GTE Products Corp., Danvers, Mass.

Filed Jul. 9, 1985, Ser. No. 753,099

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—403 **3 Claims**

1. A cathodoluminescent material consisting essentially of particles of copper activated zinc sulfide cathodoluminescent phosphor having at least a partial coating of a mixture of a blue pigment of cobalt aluminate and a red pigment of ferric oxide wherein the ratio of said blue pigment to said red pigment is from about 3.5:1 to about 4.5:1 and the weight percent of said pigments are from about 0.2% to about 2% by weight of said phosphor.

4,681,808

ADHESION OF SILICONE ELASTOMER TO POLYURETHANE

Harold V. Lefler, III, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 2, 1986, Ser. No. 914,420
Int. Cl.[4] B32B *27/00, 5/14, 9/04;* B05D *1/36*
U.S. Cl. 428—425.5 5 Claims

1. A method of improving the adhesion of a silicone elastomeric coating to a polyurethane substrate consisting essentially of applying to the polyurethane surface from 0.05 to 0.2 grams per square foot of surface of a silane of the formula $ZSi(OR)_3$ where Z is an amine functional radical and R is a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, then applying a coating of a silicone elastomeric composition comprising the product obtained by mixing:

(A) from 1.0 to 400 parts by weight of the reaction product of

(i) an organosilicon resin consisting essentially of $R''_3SiO_{1/2}$ units and $SiO_{4/2}$ units, wherein R'' represents a monovalent hydrocarbon radical, and the ratio of $R''_3SiO_{1/2}$ units to $SiO_{4/2}$ units is from 0.6/1 to 0.9/1, and

(ii) a polyorganohydrogensiloxane;

(B) 100 parts by weight of a polydiorganosiloxane having the general formula $HO(R'_2SiO)_xH$, wherein R' represents a monovalent hydrocarbon radical and x has a value of from 10 to 1000;

(C) from 1 to 150 parts by weight of a filler; and

(D) from 0.10 to 13.3 parts by weight of an organotin catalyst.

5. The laminate of polyurethane, silane and silicone elastomeric composition obtained by the method of claim 1.

4,681,809

SHAPED BODIES OF CALCIUM SILICATE

Tatsuo Kitano, 7-9, Asahiku, Edomekami, Harue-cho, Sakai-gun, Fukui-ken, Japan

Filed Aug. 21, 1985, Ser. No. 768,086
Claims priority, application Japan, Aug. 27, 1984, 59-177976
Int. Cl.[4] B32B *17/06*
U.S. Cl. 428—428 11 Claims

1. A shaped body of calcium silicate of which the whole or the surface layer consists essentially of a mixture of calcium silicate crystal and at least one inorganic compound selected from the group consisting of spodumene, petalite, eucryptite, lithium orthoclase, quartz glass, Vycor glass, cordierite, beryl, aluminum titanate and zirconium phosphate, the weight ratio of the inorganic compound to the calcium silicate crystal being about 1:9 to about 4:1.

4,681,810

FIRE-RESISTANT INTERLAYER

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1985, Ser. No. 812,609
Int. Cl.[4] B32B *17/10;* C08K *5/51, 5/53;* C08L *29/14*
U.S. Cl. 428—429 18 Claims

1. An interlayer of polyvinyl butyral resin containing a compatible mixture of additives dispersed therein providing fire resistant properties thereto, said mixture comprising:

(a) a plasticizer blend of a char-forming component capable of contributing with the polyvinyl butyral resin to char formation on decomposition of the interlayer during fire exposure and an oxygen sequestering agent of consuming oxygen during fire exposure of the interlayer, wheren the char-forming component is the major constituent;

(b) a nucleating agent for dispersing fire decomposition products of the interlayer; and

(c) a heat resistant bonding resin.

4,681,811

COLOR PLUS CLEAR COATINGS EMPLOYING POLYEPOXIDES AND POLYACID CURING AGENTS IN THE CLEAR COAT

Dennis A. Simpson, Koppel; Debra L. Singer, Pittsburgh; Rostyslaw Dowbenko, Gibsonia; William P. Blackburn, Evans City, and Charles M. Kania, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 767,020, Aug. 19, 1985, Pat. No. 4,650,718. This application Mar. 7, 1986, Ser. No. 837,118
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] B05D *1/36, 7/00;* B32B *15/08, 27/38*
U.S. Cl. 428—413 33 Claims

1. A process for applying a composite coating to a substrate which comprises applying to the substrate a colored film-forming composition to form a base coat and applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat characterized in that the clear film-forming composition is a liquid crosslinkable composition comprising a polyepoxide and a polyacid curing agent having at least two carboxyl groups per molecule, the equivalents of carboxyl per epoxy in the clear film-forming composition being from about 0.3 to 3.0 and sufficient to form a crosslinked coating.

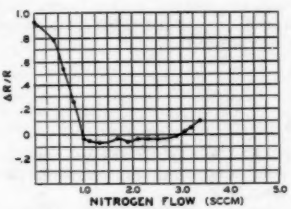
24. A substrate coated in accordance with the process of claim 1.

4,681,812

REACTIVELY SPUTTERED CHROME SILICON NITRIDE RESISTORS

James A. Schuetz, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 616,324, May 31, 1984, Pat. No. 4,569,742.
This application Oct. 7, 1985, Ser. No. 784,987
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—432 13 Claims



1. An electrically resistive thin film, produced on a substrate by a method comprising:

placing said substrate and a sputtering target comprising silicon and chromium in a reaction chamber;

evacuating said reaction chamber;

providing a sputtering atmosphere comprising nitrogen and argon in said reaction chamber;

applying an electrical bias voltage to said substrate; and

providing a radio frequency electrical discharge in said reaction chamber.

4,681,813

CERAMIC SUBSTRATE FOR A THIN LAYER MAGNETIC HEAD

Hirohide Yamada, Utsunomiya; Masahiko Sakakibara, and Yoshiharu Koike, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,660
Claims priority, application Japan, Sep. 21, 1983, 58-174738
Int. Cl.[4] G11B 5/60
U.S. Cl. 428—450 6 Claims

1. A thin layer magnetic head having a sintered ceramic substrate, said substrate consisting essentially of 100 weight parts of a ceramic material and 0.05 to 5 weight parts of at least one compound from the group consisting of silicon oxide and iron oxide, the ceramic material consisting essentially of 20 to 55 weight % of titanium carbide and the balance being substantially aluminum oxide.

4,681,814

CORROSION INHIBITED METAL

Henry Leidheiser, Jr., Bethlehem, and Hidetaka Konno, Allentown, both of Pa., assignors to Lehigh University, Bethlehem, Pa.

Division of Ser. No. 548,970, Nov. 7, 1983, Pat. No. 4,563,253, which is a continuation-in-part of Ser. No. 437,148, Oct. 27, 1982. This application Aug. 29, 1985, Ser. No. 770,856
Int. Cl.[4] B32B 15/04
U.S. Cl. 428—457 17 Claims

1. A metal member comprising a substrate composed of said metal and a corrosion-resistant surface thereon, said corrosion-resistant surfasce comprising a metal oxide layer and a water insoluble, oxidation and reduction-resistant complex compound formed between the metal oxide and an organic compound selected from the group consisting of N-benzoyl-N-phenyl-hydroxylamine, cupferron, diphenylguanidine, 8-hydroxyquinoline, 1-nitroso-2-naphthol, phenylthiourea, salicylamide, and salicylanilide, benzohydroxamic acid, 4-hydroxyqunioline, 7-hydroxyquinoline, 5-nitro-8-hydroxyquinoline, 8-nitroquinoline, o-phenylene diamine, salicylaldehyde hydrozone, 1,8-diaminonaphthalene, 8-aminoquinoline, 2,3-diaminonphthalene and quinoline.

4,681,815

COATING COMPOSITION OF POLYESTER OLIGOMER AND ACRYLIC BINDER

Andrew F. Rutkiewic, West Chester, and Clifford H. Strolle, Springfield, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1986, Ser. No. 852,706
Int. Cl.[4] B32B 15/08; C08L 61/00
U.S. Cl. 428—458 11 Claims

1. A coating composition comprising at least about 60% of a film-forming binder consisting essentially of

(a) about from 15 to 30% by weight of a polyester oligomer having a weight average molecular weight of about from 3500 to 5000 and prepared from:

(1) at least one compound selected from the group consisting of aliphatic triols having from 2 to 6 carbons atoms,

(2) at least one compound selected from the group consisting of aliphatic and aromatic diols having from 2 to 14 carbon atoms, and

(3) at least one compound selected from the group consisting of aliphatic dibasic acids hiving from 8 to 14 carbon atoms,

components (1), (2) and (3) being present in quantities to provide about from 3 to 8 moles of each of components (2) and (3) for each mole of component (1), and

(b) about from 85 to 70% of a blend of an acrylic polymer, a self-stabilized, dispersed acrylic polymer and an alkylated melamine formaldehyde crosslinking agent.

4,681,816

COMPOSITE LAMINATES COMPRISING A METALLIC SUBSTRATE AND VIBRATION DAMPER

Mikio Hashimoto, Hiroshima; Yoshinari Nakata, and Hitoshi Koga, both of Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,045
Claims priority, application Japan, Jun. 26, 1984, 59-132605
Int. Cl.[4] B32B 15/08; C08L 63/00; E04B 1/84
U.S. Cl. 428—463 9 Claims

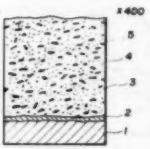
1. A composite laminate comprising at least one metallic substrate and at least one vibration damper laminated thereon, said vibration damper being composed of at least one copolymer selected from the group consisting of ethylene-(meth)acrylic acid salt copolymers and modified products thereof, the melting point of said copolymer being in the range of from 60° to 90° C. and the heat of fusion of said copolymer being at least 20 joules per gram as determined by means of a differential scanning calorimeter.

4,681,817

PISTON RING

Manabu Shinada, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,124
Claims priority, application Japan, Dec. 24, 1984, 59-270736; Jan. 31, 1985, 60-17575
Int. Cl.[4] B22F 7/00
U.S. Cl. 428—549 9 Claims



1. A piston ring with a composite plated layer at least on its outer peripheral sliding surface wherein said sliding surface is a wear surface that engages a cylinder wall or the like, said composite plated layer comprising a quantity of hard particles of a granular dispersion material dispersed in a matrix of matrix metal consisting essentially of nickel-cobalt-phosphorous alloy containing about 10% to about 40% by weight of cobalt, about 2% to about 15% by weight of phosphorous, and remainder substantially nickel.

4,681,818

OXYGEN DIFFUSION BARRIER COATING

Jalaiah Unnam, Tabb, and Ronald K. Clark, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1986, Ser. No. 840,900
Int. Cl.[4] B32B 15/04, 15/00, 15/01
U.S. Cl. 428—607 8 Claims

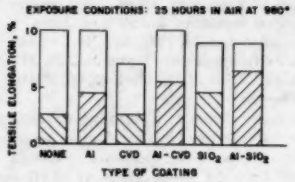
1. A method of providing an oxygen barrier coating onto a titanium substrate comprising the steps of:

providing a titanium substrate surface, electron-beam-evaporative depositing a submicron aluminum layer onto the titanium substrate surface,

depositing by sputtering a submicron silicon-dioxide layer onto the submicron aluminum layer, and

exposing the titanium substrate to an elevated temperature

during service to chemically react the titanium substrate with the submicron aluminum layer and the submicron



silicon-dioxide layer to form a thermal protective barrier of aluminide and silicide on the titanium substrate surface.

4,681,819

TREATMENT OF REFRACTORY ARTICLES

Bohdan Gnyra, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jun. 11, 1984, Ser. No. 618,995

Int. Cl.[4] B32B *9/60*

U.S. Cl. 428—697 **35 Claims**

1. A method of treating a formed refractory article for use in contact with molten aluminum metal, to protect, against attack by the molten metal, a surface portion of the article arranged for exposure to the molten metal in use, wherein said article is constructed of refractory material comprising at least one oxide selected from the class consisting of alumina, silica, aluminum silicate, and calcium silicate, said method comprising the steps of

(a) impregnating said surface portion of the formed refractory article with an aqueous solution of magnesium fluosilicate for establishing thereon a magnesium fluosilicate deposit capable of providing, upon thermal decomposition, fluoride values of a type and in an amount effective to enhance the resistance of said surface portion to attack by molten aluminum metal; and thereafter

(b) heating at least the impregnated surface portion to decompose the deposited magnesium fluosilicate thereon for producing, in situ, said fluoride values.

28. An article produced by the method of claim 1.

4,681,820

METHOD OF PRODUCING AN ELECTRICALLY CONDUCTIVE POLYMERIC MATERIAL WITH ADSORBED METAL SULFIDE AND PRODUCT

Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji, and Kiyofumi Takahashi, Yawata, all of Japan, assignors to Nihon Sanmo Dyeing Co., JPX

Division of Ser. No. 461,035, Jan. 26, 1983, Pat. No. 4,556,507. This application May 22, 1985, Ser. No. 736,777

Claims priority, application Japan, Dec. 14, 1982, 57-217852

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] B32B *9/00, 19/00*

U.S. Cl. 428—698 **13 Claims**

1. A method of improving the electrical stability of an electrically conducting article comprising a sulfide of a first metal adsorbed on a substantially cyanic group-free polymeric material, said first metal being selected from the group consisting of copper, cobalt, tin, mercury and lead, comprising treating said polymeric material with a source of ions containing a second metal selected from the group consisting of silver, gold and elements of platinum group.

11. The product obtained by the process of claim 1.

4,681,821

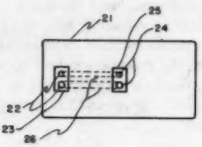
DUAL BATTERY CONNECTOR ARRANGEMENT

John A. Christopulos, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1986, Ser. No. 909,365

Int. Cl.[4] H01M *2/22*

U.S. Cl. 429—121 **2 Claims**



1. An arrangement for modifying a lithium-type battery so that it can be utilized in its customary manner or as a substitute for a Leclanche battery, said Leclanche battery being of predetermined dimensions and having a pair of female connection sockets substantially centrally located on the top surface thereof, said lithium battery being different predetermined dimensions than said Leclanche battery and having a pair of female connection sockets located at a predetermined off-center position on the top surface thereof, said lithium; battery also having a second pair of female connection sockets positioned on the top surface thereof and at a location which corresponds to the location of said connection sockets of the Leclanche battery, and a pair of electrical conductors plated on the underside of said top surface of said lithium battery, said electrical conductors serving to interconnect the two pairs of female connection sockets of said lithium battery in parallel.

4,681,822

NOVEL COMPOSITES OF AN IONIC CONDUCTING POLYMER AND AN ELECTRONIC CONDUCTING POLYMER

Claude M. Berthier, Grenoble, France, and Richard H. Friend, Cambridge, England, assignors to The British Petroleum Company, p.l.c., London, England

PCT No. PCT/GB84/00382, § 371 Date Sep. 9, 1985, § 102(e) Date Sep. 9, 1985, PCT Pub. No. WO85/02294, PCT Pub. Date May 23, 1985

PCT Filed Nov. 8, 1984, Ser. No. 752,047

Claims priority, application United Kingdom, Nov. 9, 1983, 83 29906

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—191 **8 Claims**

1. An ionic/electronic composite conductor comprising a continuous, coherent electronic conducting material selected from the group consisting of polyacetylene, polyphenylene, polyphenyl diphenyl vinylene and a substituted polyacetylene intimately mixed with a continuous ionic conducting material which is a mixture of a complex of an ionic salt and a polymeric solvating agent, such that the ionic conducting material has an increased melting point over its normal melting point.

4,681,823

LITHIUM/FLUORINATED CARBON BATTERY WITH NO VOLTAGE DELAY

Hsueh S. Tung, Williamsville; David J. Friedland, Snyder; Bernard Sukornick, Williamsville, all of N.Y.; Lynn E. McCurry, Los Alamos, N. Mex.; Richard E. Eibeck, Orchard Park, and George D. Lockyer, Clarence Center, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 19, 1986, Ser. No. 864,242

Int. Cl.[4] H01M *4/08, 4/36, 6/16*

U.S. Cl. 429—218 9 Claims

1. A method for producing an improved fluorinated carbon, for use as a cathode active material in a lithium fluorinated carbon battery, which inhibits initial voltage delay upon discharge, which comprises:

(a) introducing a comminuted carbon into a static bed reactor;

(b) foring a bed of said carbon to a depth of at least 0.5 cm; and

(c) subjecting said carbon bed to a fluorination reaction under controlled reaction time with fluorine to produce an inhomogeneous fluorinated carbon product and until the carbon attains a weight gain of at least 10 percent.

4,681,824

METHOD OF MANUFACTURING FLUORESCENT SCREENS OF COLOR PICTURE TUBES

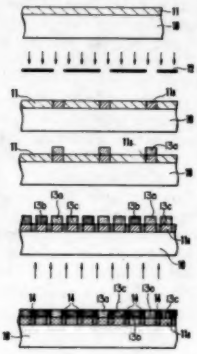
Yoshifumi Tomita, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,155

Claims priority, application Japan, Apr. 20, 1981, 56-58531

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—24 5 Claims



1. A method of manufacturing a fluorescent screen of a color picture tube comprising the steps of:

forming a film of substance that becomes sticky when exposed to light on an inner surface of a panel of said tube;

exposing predetermined portions of said film through a shadow mask to render sticky exposed portions;

repeatedly applying powder of phosphors of respective colors onto the portions which became sticky so as to form phosphor picture elements of respective colors with said film uncovered between said formed picture elements;

exposing the uncovered portions of said film other than said predetermined portions to render them sticky without using the shadow mask; and

finally applying a powder of light absorbing substance to said uncovered portions other than said predetermined portions to form a black matrix film.

2. The method according to claim 1 wherein said exposing the other portions is back exposure.

4,681,825

ELECTROPHOTOSENSITIVE MEMBER HAVING AN AMORPHOUS SILICON-GERMANIUM LAYER

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsuhara, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,589

Claims priority, application Japan, Jul. 16, 1984, 59-147918

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—57 11 Claims

1. An electrophotosensitive member which comprises:

a substrate;

a first amorphous silicon layer having a thickness of about 5 to 30 micrometers;

an amorphous silicon:germanium photoconductive layer of about 100 Å to 20 micrometers thickness formed on said first amorphous silicon layer; and

a second amorphous silicon layer of about 5 to 30 micrometers thickness formed on said amorphous silicon:germanium layer,

said amorphous silicon:germanium layer being situated at a distance from said substrate in the range of 20 to 80% of the total thickness of said layers,

said first amorphous silicon layer being of a conductivity type to control a majority carrier of said layer to be a polarity which is the same as the polarity of charging, and said second amorphous silicon layer being a conductivity type to control a majority carrier of said layer to be a polarity opposite to the polarity of charging.

4,681,826

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

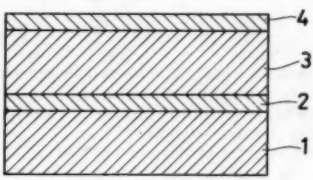
Takeo Fukatsu, Uji; Kazuyuki Goto; Hisao Haku, both of Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 640,314, Aug. 13, 1984, Pat. No. 4,624,905. This application Aug. 14, 1986, Ser. No. 896,617

Claims priority, application Japan, Feb. 14, 1984, 59-26254; Feb. 14, 1984, 59-26255

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—65 13 Claims



1. An electrophotographic photosensitive member comprising:

(a) a substrate;

(b) a photoconductive layer superposed on the substrate, said layer comprising amorphous silicon having oxygen added thereto in an amount of from 2.5×10^{19} to 1.5×10^{22} atoms/cm^3 to increase its resistivity; and

(c) a surface layer superposed on the photoconductive layer, the surface layer having a thickness in the range of from about 0.1 to 5 μm and comprising amorphous silicon having added thereto carbon to form an insulating material therein, the concentration of carbon varying differen-

tially from a minimum on the substrate side of the surface layer to a maximum on the surface side thereof.

4,681,827

ORGANIC ELECTROPHOTOGRAPHIC MATERIAL SENSITIZED BY CYANINE DYE

Werner Franke, Wiesbaden, and Richard Brahm, Ingelheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

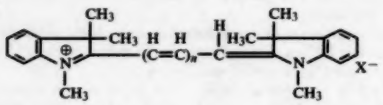
Filed Apr. 15, 1986, Ser. No. 852,157

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513747

Int. Cl.[4] G03G *5/06, 5/09*

U.S. Cl. 430—83 **13 Claims**

1. Electrophotographic recording material comprising an electrically conductive base material and at least one photoconductive layer which comprises (i) an organic photoconductor selected from the group consisting of an oxazole, an oxadiazole, a hydrazone and a pyrazoline compound, (ii) a binder and (iii) at least one cyanine sensitizing compound represented by the formula:



wherein n denotes 2 or 3 and X^- denotes a monovalent anion.

4,681,828

METHOD OF CHEMICAL ELECTROGRAPHIC IMAGE AMPLIFICATION USING CHEMICALLY ACTIVE TONER PARTICLES

Peter S. Alexandrovich; Joseph W. Manthey; John W. May, and Chandra Sreekumar, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,727

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—97 **17 Claims**

1. A method of forming an image which comprises applying electrographic toner particles to a charge pattern on a support followed by a chemical amplification processing step comprising heating the toner image in the presence of an image-receiving element comprising:

(a) a cobalt(III) complex capable of releasing an amine on processing, and

(b) an amplifier which, on reaction with an amine:

(i) forms a dye or dye precursor, or

(ii) reduces the cobalt(III) complex, resulting in the release of additional amine,

said toner comprising an activator which, under the conditions of processing releases an amine either directly or indirectly.

4,681,829

SINGLE COMPONENT RED DEVELOPER COMPOSITIONS

Bernard Grushkin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1986, Ser. No. 902,720

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **17 Claims**

1. A positively charged single component toner composition comprised of resin particles, pigment particles selected from the group consisting of substituted perylenes and monoazo pigments, and a charge enhancing additive.

4,681,830

FLUORINATED CARBON-CONTAINING DEVELOPER COMPOSITION

Randall H. Helland, Richfield, and Craig A. Burton, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 625,314, Jun. 27, 1984, abandoned, which is a continuation of Ser. No. 159,939, Jun. 16, 1980, abandoned. This application Apr. 24, 1986, Ser. No. 855,891

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—110 **15 Claims**

1. A flowable, dry powder of particles that has a static conductivity of less than about 10^{-3} mhos per centimeter in an electric field of 10,000 d.c. volts per centimeter comprising

(a) from about 30 to 80 parts by weight of a thermoplastic binder that has a static conductivity of at most about 10^{-12} mhos per centimeter, said binder being selected from the group consisting of waxes that have a melting point in the range of about 45° C. to 150° C., organic resins that have a softening point above about 60° C., and mixtures of said waxes and said resins; and correspondingly, from about 70 to 20 parts by weight of a magnetically responsive material and

(b) from about 0.4 to 3 parts by weight per 100 parts by weight of component (a) of fluorinated carbon that has a degree of fluorination in the range of 15% to 30% and an average diameter below about 2 microns, wherein said fluorinated carbon comprises a radially dispersed zone around the outer portions of said particles and wherein said fluorinated carbon renders said dry powder more negatively chargeable.

4,681,831

CHARGEABLE RESINS FOR LIQUID ELECTROSTATIC DEVELOPERS COMPRISING PARTIAL ESTER OF 3-HYDROXYPROPANESULFONIC ACID

James R. Larson, and Torence J. Trout, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1986, Ser. No. 880,155

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—114 **18 Claims**

1. A liquid electrostatic developer containing negatively chargeable resin particles with improved charging characteristics, said developer consisting essentially of

(A) nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount,

(B) nonpolar liquid soluble ionic or zwitterionic charge director compound, and

(C) resin particles of a polymer containing at least one acidic constituent having a pKa of less than 4.5 measured at 25° C. in water and an acid number due to said acidic constituent of at least one, the resin particles having an average by area particle size of less than 10 μm.

4,681,832

ELECTROPHOTOGRAPHIC LIQUID DEVELOPER

Hiromichi Tachikawa; Hiroaki Yokoya; Syu Watarai, and Katuzi Kitatani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 10, 1986, Ser. No. 817,650

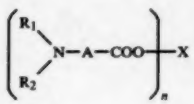
Claims priority, application Japan, Jan. 10, 1985, 60-2518

Int. Cl.[4] G03G *9/12*

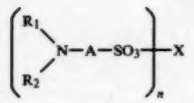
U.S. Cl. 430—115 **19 Claims**

1. An electrophotographic liquid developer comprising a coloring agent, a coating agent, a dispersant, an electric charge adjustor, and a carrier liquid, wherein said coating agent is a copolymer of a long-chain alkyl acrylate or methacrylate and methylmethacrylate, wherein the long-chain alkyl group is a straight-chain or branched alkyl group having from 8 to 22 carbon atoms, the copolymer has a softening temperature within the range of from 40° to 140° C. and a number-average

molecular weight of from 5×10^3 to 1×10^5 and the copolymer of the long-chain alkyl acrylate or methacrylate to methylmethacrylate has a copolymerization molar ratio of from 0.1/9.9 to 5/5 and the electric charge adjustor is an amino acid derivative reaction mixture obtained by mixing with water a reaction mixture which has been obtained by reacting a compound of formula (1) or (2) shown below or an amino acid with a titanium compound in an organic solvent:



(1)



(2)

wherein R_1 and R_2 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, an acyl group, an alkylsulfonyl group, an alkylphosphonyl group or an arylsulfonyl or an arylphosphonyl, wherein R_1 and R_2 can be the same or different from each other and wherein R_1 together with R_2 can optionally form a ring, provided that R_1 and R_2 do not both represent hydrogen atoms at the same time; A represents an alkylene group or a substituted alkylene group, X represents a hydrogen atom, a monovalent, divalent, trivalent, or tetravalent metal or a quaternary ammonium cation; and n represents a positive integer.

4,681,833

LIGHT-SENSITIVE NEGATIVE WORKING COMPOSITION WITH DIAZONIUM CONDENSATE, EPOXY RESIN, AND COMBINATION OF POLYMERS WITH ACRYLIC GROUPS

Kohtaro Nagasawa, Tokyo, and Kunio Morikubo, Saitama, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,249

Claims priority, application Japan, Mar. 7, 1984, 59-41874

Int. Cl.[4] G03C *1/60*

U.S. Cl. 430—175 **9 Claims**

1. A negative-working light-sensitive composition consisting essentially of in admixture:

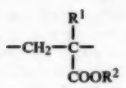
(A) a light-sensitive diazo compound which is a salt of a 4-diazodiphenylamine/formaldehyde condensate;

(B) a polymeric compound; and

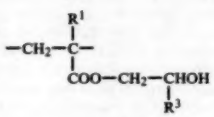
(C) an epoxy resin, wherein the polymeric compound (B) is a combination of Polymer (B-1) and Polymer (B-2) as described below:

Polymer (B-1):

Polymer containing the structural units of the following general formulae (i), (ii) and (iii):



(i)



(ii)

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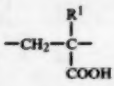


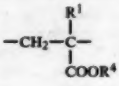
(iii)

(wherein R^1 is a hydrogen atom or a methyl group, R^2 is an unsubstituted or substituted benzyl group, a lower alkyl group).

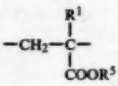
or a halogen-substituted lower alkyl group, and R^3 is a hydrogen atom, a lower alkyl group, or a halogen-substituted lower alkyl group:

Polymer (B-2):

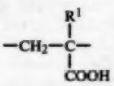
Polymer containing the structural units of the following general formulae (iv), (v) and (vi):



(iv)



(v)



(vi)

(wherein R^1 is the same as defined above, R^4 is a tert- or iso-butyl group, and R^5 is a lower alkyl group),

and wherein the proportion of component (A) is from about 1 to 40% by weight, the proportion of the polymer (B-1) is from about 30 to 75% by weight, the proportion of the polymer (B-2) is from about 0.1 to 20% by weight, and the proportion of the epoxy resin (C) is from about 5 to 50% by weight.

4,681,834

OPTICAL RECORDING ELEMENT

Howard E. Simmons, III, 751 Crossan Dr., Newark, Del. 19711

Continuation of Ser. No. 585,106, Mar. 1, 1984, Pat. No. 4,581,317. This application Mar. 10, 1986, Ser. No. 837,844

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—270 **2 Claims**

1. An optical recording element comprising a light-absorptive layer supported by a dimensionally stable substrate in which the light-absorptive material is a uniformly smooth, thin, homogeneous layer comprising a film-forming polymeric dye diluted with an inert, transparent and compatible polymer to lower the light absorption level thereof, said light-absorptive material having a light absorptivity of at least 0.046 in the visible and/or infrared spectral regions.

4,681,835

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING PYRAZOLOAZOLE-TYPE MAGENTA COUPLER USING A FINAL BATH CONTAINING A SOLUBLE IRON SALT

Takatoshi Ishikawa, and Kiyoshi Nakazyo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 12, 1985, Ser. No. 807,934

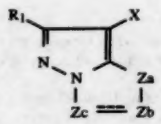
Claims priority, application Japan, Dec. 14, 1984, 59-264185

Int. Cl.[4] G03C *5/00, 5/24, 7/38*

U.S. Cl. 430—386 **14 Claims**

1. A method for processing a silver halide color photographic material, which comprises processing a photographic

material containing at least one pyraoloazole type magenta coupler represented by the following general formula (I) in a final bath containing a soluble iron salt in an amount of at least 1×10^{-4} mol/l:



(I)

wherein R_1 represents a hydrogen atom or a substituent, X represents a hydrogen atom or a group capable of being eliminated by the coupling reaction with an oxidation product of an aromatic primary amine developing agent, and Z_a, Z_b and Z_c each represents methine group, a substituted methine group, =N— or —NH—, provided that one of the Z_a-Z_b and the Z_b-Z_c bonds is a double bond and the other is a single bond, in which when it represents a double bond, the Z_b-Z_c bond includes one which constitutes a part of an aromatic ring, and further, the substituent R_1 or X, or the substituted methine represented by Z_a, Z_b or Z_c may form a polymer including a dimer.

4,681,836

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING HIGH CONTRAST NEGATIVE IMAGE USING THE SAME

Nobuaki Inoue; Yoshio Inagaki, and Kimitaka Kameoka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 660,580, Oct. 12, 1984, abandoned. This application Nov. 20, 1986, Ser. No. 933,258

Claims priority, application Japan, Oct. 13, 1983, 58-191245

Int. Cl.[4] G03C 1/10, 1/34

U.S. Cl. 430—434 **25 Claims**

1. A negative-working silver halide photographic material which has at least one silver halide emulsion layer containing silver halide grains containing from 1×10^{-8} to 8×10^{-6} mole of a rhodium salt per mole of silver, and containing in said emulsion layer or another hydrophilic colloidal layer a compound represented by formula (I)

$$R^1—NHNH—G—R^2 \quad (I)$$

wherein R^1 represents an aliphatic group or an aromatic group; R^2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted imino group.

22. A method for forming a high contrast negative image in which a silver halide photographic material having at least one silver halide emulsion layer containing silver halide grain containing from 1×10^{-8} to 8×10^{-6} mole of a rhodium salt per mole of silver, and containing in said emulsion layer or another hydrophilic colloidal layer a compound represented by formula (I)

$$R^1—NHNH—G—R^2 \quad (I)$$

wherein R^1 represents an aliphatic group or an aromatic group; R^2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted imino group; is exposed to an imagewise pattern of light and then development-processed with a developer containing 0.15 mole/liter or more of sulfite ion and having a pH adjusted to from 9.5 to 12.3.

4,681,837

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

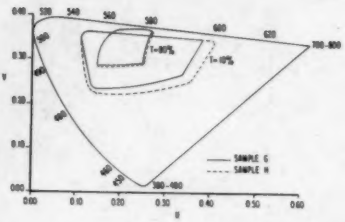
Akio Mitsui, and Noboru Ohta, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 15, 1985, Ser. No. 787,820

Claims priority, application Japan, Oct. 12, 1984, 59-213977

Int. Cl.[4] G03C 7/32

U.S. Cl. 430—504 **29 Claims**



1. A silver halide color photographic material comprising a support having thereon at least three silver halide emulsion layer units sensitive to three primary colors of blue, green and red light, respectively, at least one of the silver halide emulsion layer units having at least two layers which are different in sensitivity from each other and containing at least Coupler (A′) described below and Coupler (B) described below and one of said layers is in charge of color formation of the highest density portion in the characteristic curve of these layers and contains Coupler (B) described below which forms a dye having the maximum absorption wavelength different from a dye formed from Coupler (A) described below in an amount of at least 30 mol% of the total amount of the couplers included therein, wherein each of Couplers (A), (A′) and (B) form dyes upon oxidative coupling with an aromatic primary amine developing agent during color development processing, Coupler (A) being in at least one of the blue-, green- or red-sensitive silver halide emulsion layer units, and Coupler (A) denotes (i) a coupler which forms a dye having the maximum absorption in the wavelength range from 400 nm to less than (the maximum absorption wavelength of a dye formed from Coupler (A′)+5) nm, when the coupler is employed in a blue-sensitive silver halide emulsion layer unit, (ii) a coupler which forms a dye having the maximum absorption in the wavelength range from 510 nm to less than (the maximum absorption wavelength of a dye formed from Coupler (A′)+5) nm, when the coupler is employed in a green-sensitive silver halide emulsion layer unit, or (iii) a coupler which forms a dye having the maximum absorption in the wavelength range from more than (the maximum absorption wavelength of a dye formed from Coupler (A′)−5) nm to 700 nm, when the coupler is employed in a red-sensitive silver halide emulsion layer unit; Coupler (A′) denotes a coupler which is employed in the largest amount by mol among the couplers contained in one or more layers than the layer which is in charge of color formation of the highest density portion in a characteristic curve of the silver halide emulsion layer unit; Coupler (B) denotes a coupler which forms a dye having the maximum absorption in the wavelength range other than that of a dye formed from Coupler (A); and the above described Couplers (A), (A′) and (B) are substantially colorless and the maximum absorption of the dyes formed therefrom are present in (i) the wavelength range from 400 nm to 480 nm when they are employed in the blue-sensitive silver halide emulsion layer unit, (ii) the wavelength range from 510 nm to 590 nm when they are employed in the green-sensitive silver halide emulsion layer unit, or (iii) the wavelength range from 600 nm to 700 nm when they are employed in the red-sensitive silver halide emulsion layer unit, wherein Coupler (B) is a coupler which forms a dye, the maximum absorption wavelength thereof is present (i) in the wavelength range from (the maximum absorption wavelength of a dye formed from Coupler (A′)+5) nm to 480 nm, when the coupler

is employed in a blue-sensitive silver halide emulsion layer unit, (ii) in the wavelength range from (the maximum absorption wavelength of a dye formed from Coupler (A')+5) nm to 590 nm, when the coupler is employed in a green-sensitive silver halide emulsion layer unit or (iii) in the wavelength range from 600 nm to (the maximum absorption wavelength of a dye formed from Coupler (A')−5) nm, when the coupler is employed in a red-sensitive silver halide emulsion layer unit.

4,681,838

SILVER HALIDE PHOTOGRAPHIC EMULSION AND PROCESS FOR PRODUCTION THEREOF

Hiroyuki Mifune; Tadao Shishido, and Yoshiaki Suzaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,595
Claims priority, application Japan, Jun. 15, 1984, 59-122984
Int. Cl.⁴ G03C *1/08, 1/34, 1/02*
U.S. Cl. 430—367 **33 Claims**

1. A process for producing a substantially surface latent image type silver halide photographic emulsion, comprising the steps of precipitation, physical ripening, washing, and chemical ripening wherein at least one compound selected from hydrogen peroxide or an adduct or precursor thereof is added to an emulsion in the step prior to the end of the chemical ripening step.

4,681,839

SYSTEMS TO PRESERVE LIVING TISSUE

Mitchell R. Swartz, 16 Pembroke Rd., Weston, Mass. 02193

Filed Sep. 23, 1982, Ser. No. 422,038
Int. Cl.⁴ A01N *1/02;* **C12N** *1/04, 5/02;* **C12M** *3/00*
U.S. Cl. 435—1 **65 Claims**

1. A system to preserve both living tissue that has been severed from its host or living cells to be stored, cloned or hybridized, that comprises:

a gas-permeable bag capable of receiving the tissue, a quantity of liquid and a biscuit and further means to maintain a sterile environment therefor during storage of the tissue;

said biscuit disposed within the bag and in the liquid including both an electrolyte to help maintain cellular internal environment of the tissue and a pH buffer, said biscuit being precisely soluble in the liquid so as to provide a quasistatic biochemical environment; and

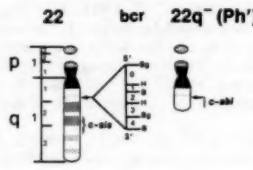
means to maintain the liquid and tissue at a required temperature, said temperature being above the freezing point of the living tissue.

4,681,840

DEOXYRIBONUCLEIC ACID MOLECULES USEFUL AS PROBES FOR DETECTING ONCOGENES INCORPORATED INTO CHROMOSOMAL DNA

John R. Stephenson, East Norwich; John Groffen, and Nora Heisterkamp, both of Westbury, all of N.Y., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jan. 18, 1984, Ser. No. 571,911
Int. Cl.⁴ G01N *33/48, 33/52;* **C12Q** *1/68*
U.S. Cl. 435—6 **26 Claims**



1. A single-stranded deoxyribonucleic acid molecule having a length less than about 25 kb which comprises at least three distinct nucleotide sequences which are present in a breakpoint cluster region and which are sites for incorporation into a chromosome of a deoxyribonucleic acid molecule encoding an oncogene.

18. A single-stranded deoxyribonucleic acid molecule according to claim 1, which is about 5.8 kb long, is derived from human chromosome 22 and contains sites for incorporation of a deoxyribonucleic acid molecule encoding the oncogene c-abl derived from human chromosome 9 during the Philadelphia translocation.

19. A deoxyribonucleic acid molecule of claim 18 labelled with a detectable marker.

20. A method of diagnosing chronic myelocytic leukemia in a human subject which is associated with an abnormal Philadelphia chromosome containing the translocated oncogene c-abl which comprises cleaving total chromosomal deoxyribonucleic acid with restriction enzymes under cleaving conditions, separating the fragments so obtained by gel electrophoresis, denaturing the fragments to obtain single-stranded deoxyribonucleic acid molecules, recovering the denatured single-stranded fragments from the gel, immobilizing them on a solid support, contacting the immobilized single-stranded deoxyribonucleic acid fragments with a deoxyribonucleic acid probe of claim 19 which includes sites for the incorporation of the chromosome 9 segment containing the oncogene c-abl under conditions permitting hybridization of complementary single-stranded molecules, identifying the hybridized molecules so formed to thereby detect abnormalities in the restriction patterns of the chromosomal deoxyribonucleic acid caused by the presence of the abnormal Philadelphia chromosome.

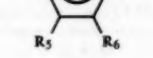
4,681,841

ENZYMATIC ASSAY METHOD

Kunio Matsumoto, and Tsutomu Hirata, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

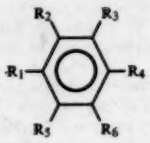
Filed Oct. 3, 1983, Ser. No. 538,680
Claims priority, application Japan, Oct. 1, 1982, 57-173569
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.⁴ C12Q *1/00, 1/34, 1/44;* **G01N** *33/50*
U.S. Cl. 435—18 **19 Claims**

1. A method for assaying a compound of the formula



wherein R_1 is hydroxyl or amino, or hydrogen if at least one of R_2, R_3, R_4, R_5 and R_6 is hydroxyl or amino, and R_2, R_3, R_4, R_5 and R_6 are hydrogen, halogen, lower alkyl, lower alkoxy, amino, substituted amino, hydroxy, carboxyl, or sulfo, or R_5 and R_6 together form a ring, comprising establishing reaction system containing the compound to be assayed and a coupler and an oxidase that consumes O_2 and effects an exzymatic oxidative condensation of said compound to be assayed and said coupler, simultaneously generating a pigment, without the formation of any H_2O_2; and measuring a detectable change in said reaction system to assay said compound.

15. A method for assaying a hydrolase, comprising the steps of: generating from a synthetic substrate by the action of said hydrolase a compound of the formula



wherein R_1 is hydroxyl or amino, or hydrogen if at least one of R_2, R_3, R_4, R_5 and R_6 is hydroxyl or amino, and R_2, R_3, R_4, R_5 and R_6 are hydrogen, halogen, lower alkyl, lower alkoxy, amino, substituted amino, hydroxy, carobxyl, or sulfo, or R_5 and R_6 together form a ring; establishing a reaction system containing a said compound and a coupler and an oxidase that consumes O_2 and effects an enzymatic oxidative condensation of said compound and said coupler, simultaneously generating a pigment, without the formation of any H_2O_2; measuring a detectable change in said reaction system to assay said compound; and relating the assay of said compound to said hydrolase consumed in generating said compound, thereby to assay said hydrolase.

4,681,842

PROCESS AND REAGENT FOR THE DIFFERENTIATED DETERMINATION OF ISOENZYMES OF ALKALINE PHOSPHATASE

Sidney B. Rosalki, London, United Kingdom, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

PCT No. PCT/EP84/00004, § 371 Date Sep. 11, 1984, § 102(e) Date Sep. 11, 1984, PCT Pub. No. WO84/02720, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 7, 1984, Ser. No. 653,237

Claims priority, application United Kingdom, Jan. 12, 1983, 8300685; May 23, 1983, 8314185

Int. Cl.⁴ C12Q *1/42*; C12N *9/16*

U.S. Cl. 435—21 **9 Claims**

1. Process for the differentiation of bone and liver isoenzymes of alkaline phosphatase in a sample containing both enzymes comprising mixing the sample with a solublized lectin which binds N-acetylglucosamine residues of the bone isoenzyme, incubating the mixture obtained for a time sufficient to bind all bone isoenzymes to form a lectin bound portion and a free isoenzyme portion containing liver isenzyme, separating the lectin bound portion from the free isoenzyme portion and determining the alkaline phosphatase activity in one or both of the portions.

4,681,843

IMMOBILIZATION OF CELLS AND ENZYMES

Peter Egerer, Wuppertal; Wulf Crueger, Erkrath, and Christian Gölker, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,350

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408299

Int. Cl.⁴ C12P *1/00*; C12N *11/04, 11/02, 11/08*

U.S. Cl. 435—41 **14 Claims**

1. In the immobilization of cells and/or enzymes by flocculation and solidification by contacting the cells and/or enzymes with tannin, epihalohydrin/polyamine copolymer and glutaraldehyde, the improvement which comprises effecting the immobilization in the presence of about 0.05 to 1.0 mole per liter of an added primary amine selected from the group consisting of sulphuric acid mono-(2-aminoethyl)-ester, 2-aminoethanol, glycine and tris-(hydroxymethyl)-aminomethane, followed by removal of the primary amine and excess glutaraldehyde by washing.

4,681,844

PROCESS FOR PRODUCING AN INTERLEUKIN-1 PREPARATION

Hans-Ake Fabricius, Breisach, and Eckart U. Köttgen, Freiburg, both of Fed. Rep. of Germany, assignors to Shanksville Corporation N.V., Netherlands Antilles

Division of Ser. No. 514,197, Jul. 15, 1983, which is a division of Ser. No. 255,251, Apr. 17, 1981, Pat. No. 4,406,830. This application May 3, 1985, Ser. No. 730,043

Int. Cl.⁴ C12P *21/00, 21/02, 21/04*; C12N *5/00*; A61K *35/14*; C07K *3/00, 15/06*

U.S. Cl. 435—68 **4 Claims**

1. A process for producing an Interleukin-1 preparation comprising

(a) incubating isolated peripheral mononuclear blood cells in a serum-free liquid tissue culture medium for from about 18 to about 24 hours to remove serum proteins adhering to the cell membranes;

(b) contacting the incubated blood cells with a mitogen for a period of about 4 to 12 hours to activate the monocytic cell population of the mononuclear blood cells for the production of Interleukin-1;

(c) washing the activated cells with a sterile liquid to remove the mitogen; and

(d) incubating the activated cells in a serum-free liquid tissue culture medium to collect Interleukin-1 in the liquid phase of the tissue culture medium to thereby obtain a preparation of Interleukin-1.

4,681,845

INCREASED GLUCOSE LEVELS IN STARCH SACCHARIFICATION USING IMMOBILIZED AMYLOGLUCOSIDASE

William H. Mueller, Darien, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 16, 1985, Ser. No. 766,328

Int. Cl.⁴ C12P *19/20*

U.S. Cl. 435—96 **8 Claims**

1. A method of converting a partially hydrolyzed starch solution to glucose comprising contacting under saccharifying conditions a feedstock of said starch solution with a first portion of a fresh immobilized amyloglucosidase which has been used for less than one half-life followed by contacting under saccharification conditions the resulting hydrolyzed product with a second portion of an aged immobilized amyloglucosidase which has been used for more than one half-life, said first and second portions being in series with the contact times and ratio of aged to fresh immobilized amyloglucosidase sufficient to afford a product containing at least about 94.0% glucose, and recovering the glucose formed thereby.

4,681,846

PROCESS FOR THE PREPARATION OF DIFFICIDIN AND DERIVATIVE ANTIBACTERIALS

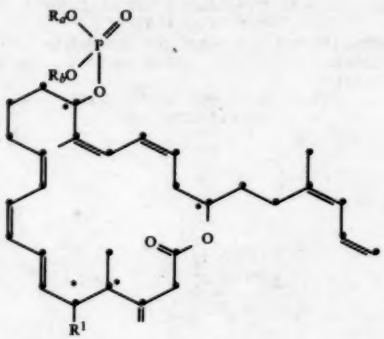
Kenneth E. Wilson, Westfield; Richard L. Monaghan, Somerset; Cheryl DeRiso, Avenel; Sheldon B. Zimmerman, Springfield; Otto D. Hensens, Red Bank; James E. Flor, Bridgewater, all of N.J.; Sagrario M. Del Val, and Maria I. M. Fernandez, both of Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 503,951, Jun. 13, 1983, Pat. No. 4,545,991. This application May 6, 1985, Ser. No. 667,664

Int. Cl.⁴ C12P *17/08*; C12R *1/125*

U.S. Cl. 435—124 **8 Claims**

1. A process for preparing a compound of the formula:



wherein R_a and R_b are members independently selected from the group consisting of hydrogen; alkali metal and alkaline earth metal cations; ammonium; and substituted ammonium; and R^1 is hydrogen or hydroxy; which comprises cultivating *Bacillus subtilis* ATCC 39320 under controlled aerobic conditions in an aqueous nutrient medium and recovering said compound.

4,681,847

NOVEL LYSOZYME-SENSITIVE MICROORGANISM

Ryoichi Katsumata, Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 372,129, Apr. 27, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,574

Claims priority, application Japan, Apr. 30, 1981, 56-65777; Sep. 25, 1981, 56-151464

Int. Cl.[4] C12N *15/00, 9/36, 1/20, 1/00, 1/06;* **C12P** *21/00, 19/34;* **C12R** *1/13, 1/15*

U.S. Cl. 435—172.3 **5 Claims**

1. A biologically pure culutre of a novel lysozyme-sensitive microorganism obtained by mutation treatment of a microorganism belonging to the genus Corynebacterium or Brevibacterium, having a sensitivity to lysozyme, having the ability to be converted to protoplast by treatment with lysozyme to remove the cell wall without pretreatment with an antibiotic and having an efficient transformation ability due to the high regenerating ability of the protoplast, wherein the lysozyme-sensitive microorganism is selected from the group consisting of *Corynbacterium glutamicum* L-15 (FERM P-5946, ATCC 31834), *Corynebacterium hercules* L-103 (FERM P-5947, ATCC 31866), *Brevibacterium divaricatum* L-204 (FERM P-5948, ATCC 31867) and *Brevibacterium lactofermentum* L-312 (FERM P-5949, ATCC 31868).

5. A biologically pure culture of a novel lysozyme-sensitive microorganism obtained by mutation treatment of a microroganism belonging to the genus Corynbacterium or Brevibacterium, having a sensitivity to lysozyme, having the ability to be converted to protoplast by treatment with lysozyme to remove the cell wall without pretreatment with an antibiotic and having an efficient transformation ability due to the high regenerating ability of the protoplast, and carrying pCG4 plasmid, wherein the lysozyme-sensitive microorganism is selected from the group consisting of *Corynebacterium glutamicum* L-15/pCG4 (FERM P-590, ATCC 31835), *Corynbacterium herculis* L-103/pCG4 (FERM P-5951, ATCC 31869), *Brevibacterium divaricatum* L-204/pCG4 (FERM P-5952, ATCC 31870) and *Brevibacterium lactofermentum* L-312/pCG4 (FERM P-5953, ATCC 31871).

4,681,848

NOVEL PEPTIDE AND USE THEREOF

Kyozo Tsukamoto, Suita; Yuzo Ichimori, Sakai, and Mitsuhiro Wakimasu, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 20, 1983, Ser. No. 534,091

Claims priority, application PCT Int'l Appl., Sep. 22, 1982, PCT/JP82/00381; Nov. 22, 1982, PCT/JP82/00444; May 31, 1983, PCT/JP83/00174

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240 **9 Claims**

1. A cloned hybridoma between (a) a spleen cell of a mammal immunized with a polypeptide of the formula:

$$\overset{(N)}{H}-X-\text{Lys Arg Ser Gln Met Leu Phe Arg Gly}-Y-\overset{(C)}{OH} \quad (I)$$

wherein X is a bond, or a peptide or amino acid residue having 1 to 16 amino acids counting from the C terminus of the peptide chain of

(N)
Ile Gln Val Met Ala Glu Leu Ser Pro Ala

(C)
Ala Lys Thr Gly Lys Arg

and Y is a peptide or amino acid residue having 1 to 5 amino acids counting from the N terminus of the peptide chain of

(N) (C)
Arg Arg Ala Ser Gln

or with a conjugate between polypeptide (I) and a carrier protein and (b) lymphoid cell from a mammal of the same or different species from the immunized mammal.

4,681,849

SUNFLOWER INDUCTION, MAINTENANCE AND REGENERATION MEDIA, METHODS OF USE AND PLANTS REGENERATED THEREFROM

Karol E. Paterson, Oakland, and Nicholas P. Everett, El Sobrante, both of Calif., assignors to Stauffer Chemical Company, Richmond, Calif.

Filed Feb. 4, 1985, Ser. No. 697,819

Int. Cl.[4] C12N *5/00, 5/02*

U.S. Cl. 435—240 **6 Claims**

1. An inbred sunflower tissue cultured cells induction and maintenance effective media and shoot regeneration effective media system comprising:

(a) an induction and maintenance effective media comprising MS salts, MS vitamins, about 30 g/L sucrose, about 500 mg/L casamino acids or about 500 mg/L casamino acids and about 40 mg/L adenine sulfate, from about 0.05 to about 0.5 mg/L 2,4-dichlorophenoxy acetic acid or from about 0.05 to about 0.5 mg/L 2,4-dichlorophenoxy acetic acid and about 1 mg/L naphthalenic acid, and from about 0.005 mg/L to about 0.4 mg/L gibberellic acid; and

(b) a shoot regeneration effective media comprising MS salts, MS vitamins, about 30 g/L sucrose, about 500 mg/L casamino acids or about 500 mg/L casamino acids and about 40 mg/L adenine sulfate, from about 0.05 mg/L to about 2 mg/L benzyladenine and from about 0.005 mg/L to about 0.5 mg/L gibberellic acid.

4,681,850

PHENYLALANINE AMMONIA LYASE-PRODUCING MICROBIAL CELLS

Jeffrey C. McGuire, Frederick, Md., assignor to Genex Corporation, Gaithersburg, Md.

Filed Nov. 20, 1984, Ser. No. 673,332
Int. Cl.[4] C12N *1/14, 15/00;* C12P *13/22;* C12R *1/645*
U.S. Cl. 435—254 1 Claim

1. A PAL-constitutive microorganism which is capable of producing PAL in the absence of PAL inducer, wherein said microorganism is a strain of *Rhodotorula rubra,* said strain having the identifying characteristics of *Rhodotorula rubra,* strain GX-5901, NRRL Y 15901.

4,681,851

BIOLOGICALLY ACTIVE COMPOSITION FOR PURIFYING WASTE WATER AND OUTGOING AIR

Jörg Baumgarten; Werner Frommer, both of Wuppertal; Theo Mann, Langenfeld; Imre Pascik, Monheim; Hans-Georg Rast, Leichlingen, and Dietmar Schäpel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 764,688, Aug. 12, 1985, Pat. No. 4,634,672, which is a continuation of Ser. No. 594,876, Mar. 29, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 910,056
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312578
Int. Cl.[4] D06M *16/00;* C12N *11/04;* C07G *15/00;* C02F *3/00*
U.S. Cl. 435—262 7 Claims

1. In a process for the biological purification of waste water and/or outgoing air, by contacting said air and/or water with a biological composition, the improvement wherein said biological composition is a biologically active composition comprising a polyurethane hydrogel containing (i) surface active coal having a specific surface according to BET of above 50 m^2/g, (ii) a polymer having cationic groups, and (iii) cells having enzymatic activity and being capable of growth.

4,681,852

NOVEL MICROORGANISM AND M .THOD

David E. Tribe, Wilmington, Del., assignor to Austgen-Biojet International Pty, Ltd., Melbourne, Australia

Continuation-in-part of Ser. No. 284,801, Jul. 20, 1981, abandoned. This application Jan. 18, 1983, Ser. No. 459,302
Claims priority, application Australia, Jul. 18, 1980, PE4590/80
Int. Cl.[4] C12P *13/22;* C12N *15/00;* C12R *1/19*
U.S. Cl. 435—108 12 Claims

1. A strain of *Escherichia coli* having altered production of 3-deoxy-D-arabino-heptulosonate-7-phosphate (DAHP) synthase and chorismate mutase P-prephenate dehydratase (CMP-PDH), wherein

(i) said DAHP synthase is not subject to feedback inhibition by phenylalanine, tryosine, or tryptophan present within the microorganism and said DAHP synthase either

(a) is not subject to repression by phenylalanine, tyrosine, or tryptophan or

(b) is produced in greater amount than is produced by wild type *E. coli* and

(ii) said CMP-PDH is not subject to feedback inhibition by phenylalanine and said CMP-PDH either

(a) is not subject to repression by phenylalanine or

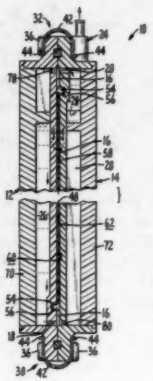
(b) is produced in a greater amount than produced by wild type *E. coli.*

4,681,853

PERFUSION SLIT CHAMBER FOR FILTER-BOUND SAMPLE ANALYSES

Kenneth J. Hardy, 2132-16th Ave., San Francisco, Calif. 94106, and Michael G. Whitesides, 654 Minnesota St., Daly City, Calif. 94107

Filed Oct. 23, 1985, Ser. No. 790,586
Int. Cl.[4] C12M *1/40*
U.S. Cl. 435—288 3 Claims



1. An apparatus for treating samples bound to a support membrane and the like with a solution without pumping the solution through the membrane, the apparatus comprising:

first and second cover plates, at least one of the first and second cover plates having a recess defined on one side thereof, the cover plates being matable to form a treatment chamber therebetween;

a membrane supported in the chamber;

first and second reagent ports defined in at least one of the first and second cover plates for fluidly communicating into and alternatively out of the treatment chamber with each port communicating with both sides of the membrane;

first and second valve means for controlling fluid communication through the first and second reagent ports, respectively, to the treatment chamber;

clamping means for releasably securing the mater cover plates together;

passageway means extending through the chamber along both sides of the memberane for providing bilaminar flow along the faces of a membrane in the treatment chamber without pumping substantial quantities of solution through the membrane; and

internal of the treatment chamber, a plurality of support pegs affixed to the cover plates for supporting the membrane and allowing solution flow on each side of the membrane from the first reagent port to the second reagent port.

4,681,854

GEOCHEMICAL OIL PROSPECTING METHOD USING IN SITU SIMULATION OF DIAGENETIC PROCESSES

Charles T. Feazel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,369
Int. Cl.[4] G01N *33/24*
U.S. Cl. 436—31 9 Claims

1. A process comprising

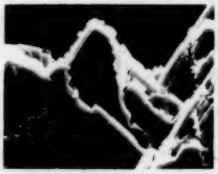
placing a mineral substrate selected from the group consisting of calcite, dolomite, quartz, anhydrite and feldspar, the mineral substrate having an essentially even planar face,

within a fluid-tight vessel into a subterranean earth formation containing connate formation fluids;

causing the mineral substrate to be exposed to the connate formation fluids present;

permitting contact of the mineral substrate by the connate formation fluids for at least a time sufficient to effect occlusion or etching on said face of the substrate;

withdrawing the mineral substrate within the vessel from the formation;



removing the substrate from the vessel and examining the mineral substrate for indications of occlusion or etching on said face of the mineral substrate;

comparing said face of the mineral substrate as placed into the formation with said face of the mineral substrate as withdrawn from the formation; and

determining from the occlusion or etching of the withdrawn substrate a property of the formation.

4,681,855

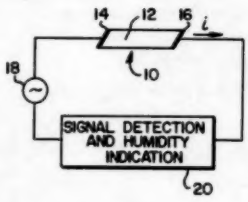
HUMIDITY SENSING AND MEASUREMENT EMPLOYING HALOGENATED ORGANIC POLYMER MEMBRANES

Peter H. Huang, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 5, 1985, Ser. No. 762,740

Int. Cl.[4] G01N 27/12

U.S. Cl. 436—39 **30 Claims**



1. Humidity sensitive apparatus comprising a thin film of hygroscopic, halogenated organic polymer having pendant groups of a relatively strong acidic type and pendant groups of a relatively weak acidic type, and means attached to said polymer film for applying to the same a signal of a type having a parameter which will be affected by said polymer film in varying degree as a function of the water content of said polymer film.

4,681,856

MURAMYLDIPEPTIDE ACTIVE ESTER DERIVATIVES

Toshiyuki Hamaoka, Nara; Hiromi Fujiwara, Hyogo, and Tsuneo Kusama, Tokyo, all of Japan, assignors to Toshiyuki Hamaoka Dalichi Seiyaku Co., Ltd., Japan

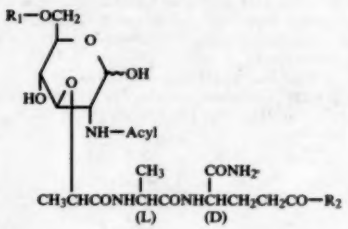
Filed Aug. 20, 1984, Ser. No. 641,905

Claims priority, application Japan, Aug. 18, 1983, 58-149617

Int. Cl.[4] C08B 37/00

U.S. Cl. 536—53 **8 Claims**

1. A muramyldipeptide derivative represented by the formula:



wherein R_1 represents a straight or branched chain fatty acid residue having 2 to 30 carbon atoms; R_2 represents an active ester residue selected from the group consisting of a p-nitrophenol group, a 2,4-dinitriphenol group, a 2,4,5-trichlorophenol group, a pentachlorophenol group, a pentafluorophenol group, a thiophenol group, an N-hydroxysuccinimido group, an N-hydroxybenzotriazole group, an N-hydroxy-5-norbornene-2,3-dicarboximido group, an N-hydroxyphthalimido group, an N-hydroxymorpholine group, an N-hydroxypiperidine group, a 2-mercaptopyridine group, a 2-hydroxypyridine group, a 3-hydroxypyridine group, an 8-hydroxyquinoline group and a 2-hydroxyphenol group; and "Acyl" represents an acyl group having 2 to 6 carbon atoms.

4,681,857

METHOD FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

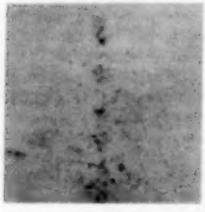
Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Senichi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 13, 1985, Ser. No. 765,245

Claims priority, application Japan, Aug. 15, 1984, 59-170227; Aug. 22, 1984, 59-174828

Int. Cl.[4] G01N 33/20

U.S. Cl. 436—78 **27 Claims**



1. A method for detecting phosphorous segregates in a metallic material, comprising,

(a) attaching a test sheet onto that surface of a metallic material to be tested,

(b) maintaining the sheet in contact with the metallic material surface in the presence of an aqueous solution comprising 0.00005 to 0.2 mol/l of copper ion and 0.0001 to 1.0 mol/l of nitrate ion until stains appear,

(c) removing the sheet from the metallic material surface, and

(d) treating the sheet from step (c) with a color reagent containing molybdate ion to form colored phosphorus molybdate which indicates the presence of phosphorus segregates.

4,681,858

DISSOLUTION CELL AND METHOD FOR DETERMINING THE IN-VITRO RELEASE OF A DRUG

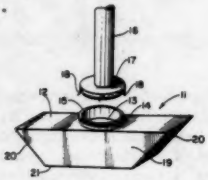
Atma Chaudhari, West Hill, and Joseph K. S. Lee, Agincout, both of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 11, 1986, Ser. No. 940,708

Claims priority, application Canada, Jun. 19, 1986, 511997

Int. Cl.[4] B01D *11/02;* **G01N** *1/00, 33/15, 37/00*

U.S. Cl. 436—165 **13 Claims**



1. A dissolution cell assembly for measuring the release rate of a drug comprising:

a dissolution cell comprising

(a) a rectangular top wall having a central opening therein;

(b) a pair of trapezoidal side walls extending generally perpendicularly from said top wall;

(c) a pair of end walls comprised of a mesh material and extending from said top wall, said end walls being attached to and disposed between said side walls; and

(d) a bottom wall comprised of a mesh material attached to and extending between said end walls and said side walls;

(e) closure means for closing said opening releasably attached about said opening; and means for attaching a shaft to said closure means for rotatably mounting said dissolution cell.

9. A method for the in-vitro determination of the release of a drug from a drug form comprising:

(a) placing said drug form in a dissolution cell of a dissolution cell assembly which comprises:

a dissolution cell comprising

(i) a rectangular top wall having a central opening therein;

(ii) a pair of trapezoidal side walls extending generally perpendicularly from said top wall;

(iii) a pair of end walls comprised of a mesh material and extending from said top wall, said end walls being attached to and disposed between said side walls; and

(iv) a bottom wall comprised of a mesh material attached to and extending between said end walls and said side walls;

(v) closure means for closing said opening releasably attachable about said opening; and a shaft attached to and extending from said closure means;

(b) attaching said closure means about said opening to close said opening;

(c) mounting said shaft in a rotation means;

(d) placing said dissolution cell in a dissolution medium;

(e) rotating said rotation means to rotate said dissolution cell; and

(f) measuring the change in concentration of said drug released from said form at predetermined intervals.

4,681,859

FLUORESCENCE POLARIZATION IMMUNOASSAY FOR HEAVY ANTIGENS

Peter B. Kramer, Newton Centre, Mass., assignor to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Sep. 21, 1984, Ser. No. 653,382

Int. Cl.[4] G01N *33/566, 33/563, 33/536, 33/533*

U.S. Cl. 436—501 **2 Claims**

1. A method for determining the presence of a ligand in an aqueous sample comprising the steps of:

providing a ligand binding partner capable of specifically combining with said sample ligand at a binding site on said ligand;

further providing fluorescently labeled epitope simulating peptide capable of specifically combining with said ligand binding partner whereby binding of (i) said sample ligand of (ii) said simulating peptide to said ligand binding partner blocks binding of (i) said simulating peptide or (ii) said sample ligand, respectively, to said ligand binding partner;

allowing said sample ligand and said simulating peptide to combine with said ligand binding partner;

illuminating said fluorescent label with polarized light; and

detecting fluorescence depolarization and relating said depolarization to the presence or absence of ligand in said sample.

4,681,860

CERAMIC MATERIALS FROM POLYCARBOSILANES

Duane R. Bujalski, Monitor Township, Bay County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 868,207, May 23, 1986, abandoned, which is a continuation of Ser. No. 678,122, Dec. 4, 1984, abandoned. This application Dec. 5, 1986, Ser. No. 938,472

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—88 **11 Claims**

1. A method of preparing a ceramic material with increased ceramic yield, said method comprising heating a modified polycarbosilane in an inert atmosphere or in a vacuum to a temperature of at least 750° C. until said modified polycarbosilane is converted to a ceramic material with increased ceramic yield relative to a non-modified polycarbosilane heated under the same conditions, wherein said modified polycarbosilane is prepared by mixing the non-modified polycarbosilane with an effective, ceramic yield increasing, amount of iron octoate, wherein the non-modified polycarbosilane is prepared by thermally decomposing and polycondensing a polysilane or polysilanes by heating said polysilane or polysilanes at a temperature of 300°–2000° C. in an inert gas, hydrogen, or vacuum wherein said polysilane or polysilanes are selected from the group consisting of cyclic polysilanes of the general formula

$$(R^1R^2Si)_n$$

and linear polysilanes of the general formula

where n is greater than or equal to 4; where m is greater than or equal to 2; and where R^1, R^2, R^3, and R^4 are independently selected from the group consisting of hydrogen, alkyl groups containing 1 to 4 carbon atoms, phenyl, $—Si(R^5)_3$ groups where R^5 is an alkyl group containing 1 to 4 carbon atoms, and halogen atoms.

4,681,861
SILICON CARBIDE SINTERED BODY AND PROCESS FOR PRODUCTION THEREOF

Akira Saito, Kokubu, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Jan. 29, 1986, Ser. No. 823,931
Claims priority, application Japan, Jan. 31, 1985, 60-19068
Int. Cl.[4] C04B *35/56*
U.S. Cl. 501—89 **13 Claims**

5. A process for producing a silicon carbide sintered body, which comprises the steps of:

(a) mixing a starting material in powder form composed of 0.2 to 5% by weight, calculated as elemental aluminum, of aluminum nitride, 0.2 to 5% by weight, calculated as elemental rare earth, of at least one rare earth compound, and 0.2 to 10% by weight, calculated as elemental chromium, of chromium carbide, and the balance of silicon carbide; and

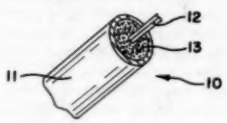
(b) sintering the mixed powder into an integrated molded article.

11. A silicon carbide sintered body composed of 0.2 to 5% by weight, calculated as elemental aluminum, of aluminum nitride, 0.2 to 5% by weight, calculated as elemental rare earth, of a rare earth compound, 0.2 to 10% by weight, calculated as elemental chromium, of chromium carbide, and the balance being silicon carbide, wherein said silicon carbide is present in the sintered body as particles of the alpha-type crystal structure which are substantially spherical and have an average diameter of 0.5 to 2 micrometers, and particles which contain chromium as a main component and aluminum and silicon when analyzed by an X-ray microanalyzer and show a high luminance under a metallurgical microscope are present in the crystal grain boundary containing the aluminum, rare earth and chromium components.

4,681,862
ELECTRICALLY INSULATING FILLER FOR SHEATHED HEATERS

Tadashi Kawabe, and Masafumi Kobune, both of Ako, Japan, assignors to Tateho Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Jan. 2, 1986, Ser. No. 815,633
Claims priority, application Japan, Mar. 19, 1985, 60-56413
Int. Cl.[4] C04B *35/02*
U.S. Cl. 501—108 **8 Claims**



1. An electrically insulating filler for sheathed heaters, comprising a volume of globular and nonglobular particles containing at least approximately 95% by weight of MgO and said globular particles forming at least 5 wt. % of the volume.

4,681,863
HIGH-DENSITY MAGNESIA-CALCIA CLINKER AND PROCESS FOR PRODUCTION THEREOF

Kosei Yamamoto; Akira Kaneyasu, and Yo Arita, all of Ube, Japan, assignors to Ube Chemical Industries Co., Ltd., Yamaguchi, Japan

Filed Jul. 17, 1985, Ser. No. 755,782
Int. Cl.[4] C04B *35/04*
U.S. Cl. 501—108 **15 Claims**

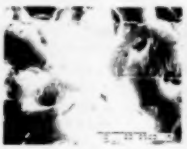
1. A magnesia-calcia clinker having a high density, said clinker containing MgO, CaO and Fe_2O_3 as oxides, having the following chemical composition in percent by weight

MgO, CaO and Fe_2O_3	at least 99% in total
MgO	at least 10%
CaO	at least 10%
Fe_2O_3	0.2–5%

and having a density corresponding to at least 97.5% of the theoretical density (d) defined by the following equation

$$d = \frac{A \times B \times 100}{(A - B)\,x + 100B} = \frac{120288}{0.22x + 336}$$

wherein A is the theoretical density (=3.58 g/cm^3) of periclase (MgO, B is the theoretical density (=3.36 g/cm^3) of



calcia (CaO), and x is the proportion in by weight of CaO based on the total amount of CaO and MgO in the magnesia-calcia clinker,

and said Fe_2O_3 being contained as a solid solution in periclase crystals.

8. A process for producing a magnesia-calcia clinker having a high density, which comprises adding a water-soluble iron compound to sea water, bittern or brine; simultaneously with, or after, the addition of the water-soluble iron compound, adding a calcined product of dolomite, lime or a hydrate thereof to form a precipitate composed mainly of magnesium hydroxide; mixing the resulting magnesium hydroxide with a calcium compound; and dead-burning the resulting mixture.

4,681,864
CRACKING CATALYST

Grant C. Edwards, Silver Spring; Jean-Pierre Gilson, Columbia, and Carl V. McDaniel, Laurel, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 15, 1985, Ser. No. 754,781
Int. Cl.[4] B01J *27/18, 29/06, 21/16*
U.S. Cl. 502—63 **3 Claims**

1. In a method for preparing a catalytic cracking catalyst composition which comprises:

(a) from about 1 to 50% by weight SAPO-37 molecular sieve which contains from about 5 to 40% by weight of an organic template component selected from the group consisting of TPA, TMA, and mixtures thereof; and

(b) an inorganic oxide matrix selected from the group consisting of silica, alumina, silica-alumina sols and gels, clay, zeolites and mixtures thereof;

the improvement comprising admixing said SAPO-37 molecular sieve with matrix forming components, and forming a particulate catalyst under conditions wherein said organic template remains in the pore structure of the SAPO-37 molecular sieve prior to use in a catalytic conversion process.

2. A catalytic cracking catalyst prepared by the method of claim 1.

4,681,865

CATALYST FOR THE PRODUCTION OF AROMATIC HYDROCARBONS

Hisashi Katsuno, Sodegaura; Takashi Murakawa, Ichihara, and Toshikazu Yoneda, Sodegaura, all of Japan, assignors to Research Association For Utilization of Light Oil, Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,756
Claims priority, application Japan, May 7, 1985, 60-95383; Dec. 27, 1985, 60-292775
Int. Cl.[4] B01J 29/12
U.S. Cl. 502—74 15 Claims

1. A catalyst for production of aromatic hydrocarbons, comprising zeolite L treated with a halogen-containing compound and platinum, said catalyst having been formed by treating zeolite L with said halogen-containing compound to form a halogen-compound treated zeolite L and then depositing platinum thereon.

2. The catalyst as claimed in claim 1, wherein the halogen-containing compound is a fluorine-containing compound.

3. The catalyst as claimed in claim 1, wherein the halogen-containing compound is a chlorine-containing compound.

4. The catalyst as claimed in claim 1, wherein the amount of platinum deposited is 0.1 to 5.0 wt % based on the total weight of the catalyst.

4,681,866

POLYMERIZATION CATALYST, METHOD OF MAKING AND USE THEREFOR

Max P. McDaniel, Bartlesville, Okla., and Paul D. Smith, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 718,668, Apr. 1, 1985, Pat. No. 4,619,980. This application Jul. 21, 1986, Ser. No. 887,690
Int. Cl.[4] C08F 4/78
U.S. Cl. 502—154 8 Claims

6. A method for producing an ethylene (co)polymerization catalyst which comprises:

(i) treating a predominantly silica-containing, support with 0.01–20 mole % of at least one compound selected from the groups consisting of Group IIIA oxide or compounds convertible to the oxide form, a Group VA or VB oxide or compounds convertible to the oxide form or sulfuric acid, wherein said mole % is based on untreated support and calculated as elemental treating metal,

(ii) calcining the support in a dry, oxygen-containing atmosphere at a temperature in the range of 300°–800° C. for a time in the range of 0.5–20 hours, and thereafter

(iii) combining the product of step (ii) with 0.01 to 10 wt % of at least one a zerovalent chromium compound, calculated as chromium metal and based on the weight of the treated support obtain in step (ii), under substantially anhydrous conditions.

4,681,867

SUPPORTED FISCHER-TROPSCH CATALYST AND METHOD OF MAKING THE CATALYST

Paul N. Dyer, Allentown; Ronald Pierantozzi, Orefield, and Howard P. Withers, Douglassville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 741,403, Jun. 5, 1985, Pat. No. 4,619,910. This application May 13, 1986, Ser. No. 862,844
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] B01J 21/06, 21/08, 23/46, 23/74
U.S. Cl. 502—242 12 Claims

1. Method for making a catalyst comprising the following steps:

(a) treating a silica catalyst base material with a nonaqueous solution of a decomposable salt or organic compound of a group IVB metal and removing remaining said nonaqueous solution;

(b) impregnating the product of Step (a) with a nonaqueous solution of a decomposable salt or organic compound of a Fischer-Tropsch metal catalyst from the group consisting of cobalt, iron or ruthenium, and removing remaining said nonaqueous solution; and

(c) exposing the product of Step (b) to a reducing atmosphere; all while maintaining said material and said products under conditions sufficient to avoid hydrolysis, oxidation, and calcination thereof.

4,681,868

OXYGENATE CONDENSATION CATALYST

John R. Budge, Cleveland Heights, and Senja V. Compton, Newbury, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 29, 1986, Ser. No. 867,975
Int. Cl.[4] B01J 23/04, 23/18, 23/72
U.S. Cl. 502—307 5 Claims

1. A catalyst useful for the condensation of lower oxygenates to higher molecular weight oxygenates characterized by the formula:

$$A_aCuM_cBi_dO_x \quad (I)$$

wherein

A is an alkali group metal or mixture thereof;

M is a Group IIA-VIIA element, Fe, Co, Ni, Ag, Au, Zn, Cd, P, As, Sb, Group IIIB-IVB element, lanthanides, actinides or mixtures thereof;

wherein

a=0.001–10;

c=0.1–500;

d=0.001–10; and

x=number of oxygen atoms required to satisfy the valency requirement of the remaining elements.

4,681,869

CATALYST FOR HYDROFINING OF OIL AND PROCESS FOR PREPARING THE CATALYST

Simon G. Kukes, and Stephen L. Parrott, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1985, Ser. No. 781,082
Int. Cl.[4] B01J 21/04, 21/06
U.S. Cl. 502—349 31 Claims

1. A process for preparing a composition of matter consisting essentially of (a) alumina and (b) at least one of yttrium oxide and zirconium oxide, comprising the steps of:

(A) impregnating alumina with a solution containing at least one compound of a metal selected from the group consisting of yttrium and zirconium; and

(B) heating the material obtained in step (A) under such conditions as to dry the material from step (A) and to at least partially convert said at least one metal compound to at least one of yttrium oxide and zirconium oxide;

wherein said solution used in step (A) also contains at least one compound of aluminum, which is at least partially converted to aluminum oxide in step (B).

4,681,870

PROTEIN A-SILICA IMMUNOADSORBENT AND PROCESS FOR ITS PRODUCTION

Joseph P. Balint, Jr., and Richard E. Hargreaves, both of Seattle, Wash., assignors to IMRE Corporation, Seattle, Wash.

Filed Jan. 11, 1985, Ser. No. 690,781
Int. Cl.[4] B01J 20/22
U.S. Cl. 502—403 26 Claims

1. A method for preparing an immunoadsorbent material useful for removing IgG and IgG-complexes from biological fluids, said method comprising:

introducing free amino or carboxyl groups onto a silica matrix;

reacting the silica matrix with purified protein A in the

presence of a carbodiimide at a pH in the range from 3.5 to 4.5 to covalently link the protein A to the matrix through the amino or carboxyl groups; and

washing the silica matrix at a pH in the range from 2.0 to 2.5 to remove loosely bound protein A from the matrix.

4,681,871

PHARMACOLOGICALLY ACTIVE PEPTIDES

Hansjorg Teschemacher, Universitat Giessen Frankfurterstr. 107, 6300 Giessen 1; Victor Brantl, Frauenplatz 10, 8000 Munchen; Agnes Henschen, and Friedrich Lottspeich, both of Max Planck Institut fur Biochemie, 8033 Martinsried, all of Fed. Rep. of Germany

PCT No. PCT/DE80/00072, § 371 Date Jan. 25, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO80/02696, PCT Pub. Date Dec. 11, 1980

PCT Filed May 20, 1980, Ser. No. 229,577

Claims priority, application Fed. Rep. of Germany, May 25, 1979, 2921216

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.[4] A61K *37/02;* **C07K** *5/08, 5/10, 7/06*

U.S. Cl. 514—15 **11 Claims**

1. Pharmacologically active peptides of the following formulas:

Tyr-Pro-A,
Tyr-Pro-A-Pro,
Tyr-Pro-A-Pro-B,
Tyr-Pro-A-Pro-B-Pro,
Tyr-Pro-A-Pro-B-Pro-C,
Tyr-Pro-A-Pro-B-Pro-C-Pro and
Tyr-Pro-A-Pro-B-Pro-C-Pro-D

wherein

A represents phenylalanine and tyrosine;

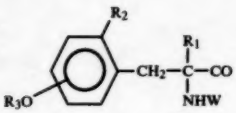
B represents glycine and tyrosine;

C represents isoleucine, proline and tyrosine;

D represents asparagine, proline and isoleucine;

and wherein

(a) the end-positioned tyrosine has the general formula



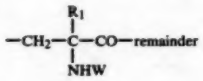
in which

R_1 is hydrogen or an alkyl group with 1 to 4 C-atoms,

R_2 is hydrogen or together with R_1 form an ethylene bond,

R_3 is hydrogen, an alkyl group with 1 to 4 C-atoms or a R_4CO-group wherein

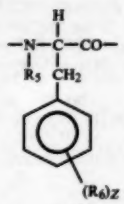
R_4 is a saturated or unsaturated straight or branched chain alkyl residue with 1 to 17 C-atoms, a pheny residue or a phenylalkyl residue with 7 to 12 C-atoms, in which the phenyl residues can be substituted by 1 or 2 substituents of the halogen series, alkyl with 1 to 4 C-atoms or alkoxy with 1 to 4 C-atoms, in which the R_3O group is in metal or para position to



in which

W represents hydrogen, alkyl with 1 to 5 C-atoms, alkenyl with 3 to 5 C-atoms, cyclopropylmethyl, cyclobutylmethyl, R_4CO-, H-Arg, H-Lys-, H-Phe-, or H-Tyr-;

(b) the phenylalanine has the general formula

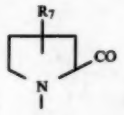


in which

R_5 represents hydrogen or alkyl with 1 to 4 C-atoms,

R_6 represents hydrogen, fluorine, chlorine, bromine, nitro, alkyl with 1 to 4 C-atoms or alkoxy with 1 to 4 C-atoms, and Z is 1 or 2;

(c) the proline has the general formula



in which

R_7 represents hydrogen, a hydroxy group, an alkyl group or alkoxy group with 1 to 4 C-atoms;

an alkyl group or alkoxy group with 1 to 4 C-atoms is bonded at the nitrogen, and one or more keto groups are positioned on the ring; and

(d) the end-positioned, C-terminal amino acid is present as an amide or ester.

4,681,872

ERYTHROMYCIN A 11,12-CARBONATE AND METHOD OF USE

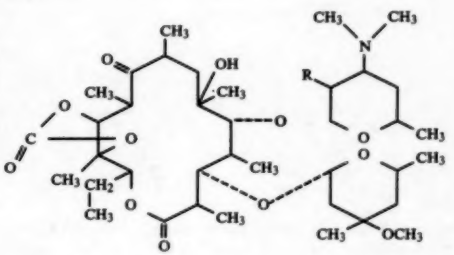
Leslie A. Freiberg, Waukegan; Howard E. Gracey, Lindenhurst, and Andre G. Pernet, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 12, 1985, Ser. No. 797,263

Int. Cl.[4] A61K *31/71;* **C07H** *17/08*

U.S. Cl. 514—29 **4 Claims**

1. A compound of the formula



where R is hydroxyl, or acyl of 1 to 6 carbon atoms, and pharmaceutically acceptable salts and esters thereof.

3. A pharmaceutical composition in unit dosage form, comprising a therapeutically effective amount of a compound according to claim 1 in combination with a pharmaceutical carrier.

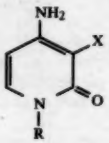
4,681,873

4-AMINO-3-HALO-2-PYRIDINONE NUCLEOSIDE AND NUCLEOTIDE COMPOUNDS

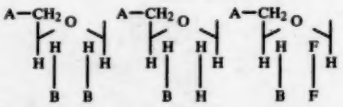
Dennis J. McNamara, and Phillip D. Cook, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 29, 1985, Ser. No. 759,816
Int. Cl.[4] A61K *31/70;* **C07H** *17/00*
U.S. Cl. 514—50 **20 Claims**

1. A compound having the structural formula



where R is selected from



wherein X is fluorine, chlorine, or bromine, and A is hydrogen, H_2PO_4, benzoyl, 4-methylbenzoyl, acetyl, propionyl or straight or branched-chain alkanoyl of from four to six carbon atoms, and B is hydrogen, benzoyl, 4-methylbenzoyl, acetyl, propionyl or straight or branched-chain alkanoyl of from four to six carbon atoms, and the pharmaceutically acceptable salts thereof.

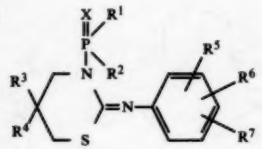
4,681,874

THIAZINEPHOSPHONIC ACID DERIVATIVES

Yoshio Hayase; Mitsuhiro Ichinari, both of Mie; Junji Taguchi, Chiba; Takeo Ishiguro, Shiga, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

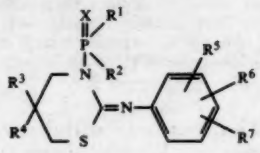
Filed Sep. 6, 1985, Ser. No. 773,133
Claims priority, application Japan, Sep. 8, 1984, 59-188744
Int. Cl.[4] C07F *9/65;* **A01N** *43/72;* **C07D** *279/06*
U.S. Cl. 514—90 **21 Claims**

1. A compound of the formula:



wherein R^1 and R^2 each is lower alkoxy, lower alkynyloxy, lower alkylthio, lower alkylamino, or C_6–C_8 arylthio selected from the group consisting of phenylthio, tolylthio and xylylthio; R^3 and R^4 each is hydrogen or lower alkyl; R^5, R^6, and R^7 each is hydrogen, lower alkyl, lower alkoxy, halogen, or trifluoromethyl; and X is oxygen or sulfur.

9. An insecticidal composition comprising an insecticidally effective amount of one or more of the compounds of the formula:



wherein R^1 and R^2 each is lower alkoxy, lower alkynyloxy, lower alkylthio, lower alkylamino, or C_6–C_8 arylthio selected from the group consisting of phenylthio, tolylthio and xylylthio; R^3 and R^4 each is hydrogen or lower alkyl; R^5, R^6, and R^7 each is hydrogen, lower alkyl, lower alkoxy, halogen, or trifluoromethyl; and X is oxygen or sulfur and one or more carriers therefor.

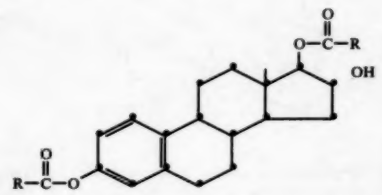
4,681,875

3,17 β-ESTRIOL DIESTERS, METHODS OF THEIR USE, AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Henry Laurent; Dieter Bittler; Sybille Beier, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,737
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418562
Int. Cl.[4] C07J *00/00;* **A61K** *31/56*
U.S. Cl. 514—182 **19 Claims**

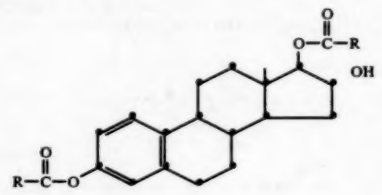
1. An estriol ester of the formula



wherein

R, in each case, is a hydrocarbon aliphatic, cycloaliphatic-aliphatic or aromatic group of 3–10 carbon atoms.

18. A method of achieving a gynecological effect in a patient comprising administering an effective amount of a 3,17β-estriol diester of the formula:



wherein

R, in each case, is a hydrocarbon aliphatic cycloaliphatic-aliphatic or aromatic group of 1–10 carbon atoms.

4,681,876

ANTIFUNGAL UTILITY OF BILE ACIDS

Brian A. Marples, Loughborough, and Reginald J. Stretton, Quorn, both of England, assignors to National Research Development Corporation, London, England

Filed Jul. 15, 1985, Ser. No. 755,016

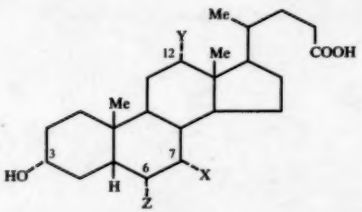
Claims priority, application United Kingdom, Jul. 13, 1984, 8417895

Int. Cl.[4] A61K *31/56*; C07J *1/00*

U.S. Cl. 514—182 6 Claims

1. A method of combatting a fungal infection in a human patient which comprises applying topically to the site of the infection in the patient at least one bile acid of the general formula

I



wherein Me represents a methyl group and each of X, Y and Z independently represents a hydrogen atom or a hydroxyl group or a derivative thereof which is a conjugate formed between the COOH group shown and the NH_2 group of an amino acid having 3 to 6 chain atoms, inclusive of the amino and acid groups, or a salt pharmaceutically acceptable of such an acid or conjugate.

4,681,877

PIVALOYLOXYMETHYL 7-β-[2-(2-AMINO-4-THIAZOLYL)-2-METHOXYIMINOACETAMIDO]-3-(2-AMINO-1,3-THIADIAZOLYL-5-THIOMETHYL)-3-CEPHEME-4-CARBOXYLATE AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Shigeaki Muto; Takao Ando; Takayoshi Fujii; Akihiko Kanno, all of Tokyo; Yoko Onishi, Mitaka; Isamu Motokawa, Hino; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

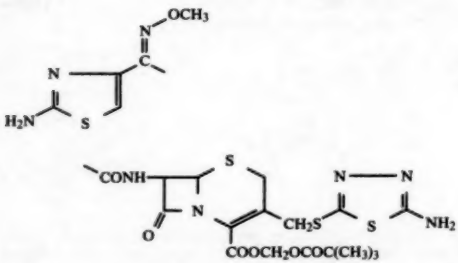
Filed Dec. 16, 1983, Ser. No. 562,003

Claims priority, application Japan, Dec. 24, 1982, 57-233697; Mar. 1, 1983, 58-33579

Int. Cl.[4] A61K *31/545*; C07D *501/36*

U.S. Cl. 514—206 4 Claims

1. Pivaloyloxymethyl 7-beta-[2-amino-4-thiazolyl) -2-methoxyiminoacetamido]-3-(2-amino-1,3,4-thiadiazolyl -5-thiomethyl)-3-cepheme-4-carboyxlate represented by the following formula:



4. A method for the treatment of infectious diseases caused by bacteria which comprises administering an effective amount of the compound pivaloyloxymethyl 7-beta-[2-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-(2-amino-1,3,4-thiadiazolyl-5-thiomethyl) -3-cepheme-4-carboxylate of claim 1.

4,681,878

FLUOROPHENO-THIAZINE AND PHARMACEUTICAL USE

John D. McDermed, Durham, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 759,504, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 678,338, Dec. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 616,311, Jun. 1, 1984, abandoned. This application Jul. 23, 1986, Ser. No. 888,278

Int. Cl.[4] A61K *31/54*; C07D *279/28*

U.S. Cl. 514—223 14 Claims

1. A compound which is 2-[10-(2-Dimethylaminopropyl)-7-fluoro-2-phenothiazinyl]-2-methylpropionic acid or a salt, ester or amide thereof.

7. A method of relieving the detrimental effects of histamine in a mammal comprising administering to said mammal an effective amount of 2-[10-(2-Dimethylaminopropyl)-7-fluoro-2-phenothiazinyl]-2-methylpropionic acid or a salt, ester or amide thereof.

4,681,879

11-SUBSTITUTED 5H,11H-PYRROLO[2,1-C][1,4]BENZOXAZEPINES AS ANTIPSYCHOTIC AND ANALGESIC AGENTS

Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Kevin J. Kapples, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

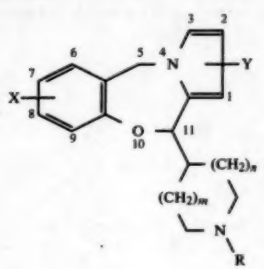
Continuation-in-part of Ser. No. 549,098, Nov. 7, 1983, Pat. No. 4,608,374. This application Mar. 20, 1985, Ser. No. 713,938

The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

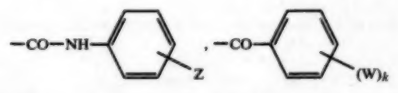
Int. Cl.[4] C07D *413/04*; A61K *31/40*, *31/445*

U.S. Cl. 514—211 60 Claims

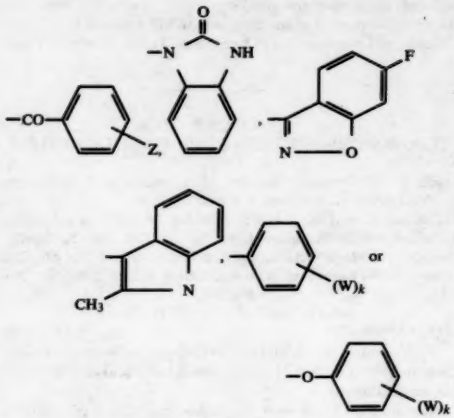
1. A compound of the formula



where m and n are each independently 0, 1 or 2 and m+n is 1 or 2, X and Y are each independently hydrogen, loweralkyl or halogen, and R is hydrogen, cyano, —C(NH$_2$)NOH,



unsubstituted loweralkyl, or substituted loweralkyl having one to three substituents each of which being independently cyano, hydroxy, cycloalkyl of 3–6 carbon atoms, furyl, thienyl,



being 1, 2 or 3, W being each independently hydrogen, halogen, hydroxy, loweralkyl, trifluoromethyl, loweralkoxy, nitro, amino, diloweralkylamino, phenoxy, or benzyloxy, and Z being hydrogen, loweralkyl or halogen, or a pharmaceutically acceptable acid addition salt thereof.

4,681,880

USE OF THIO ISOSTERES OF ERGOT PEPTIDE ALKALOIDS AS VASACONSTRICTORS

Hans Kobel, Basel; Jean-Jacques Sanglier, Oberwil; Hans Tscherter, Allschwil, and Georg Bolliger, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

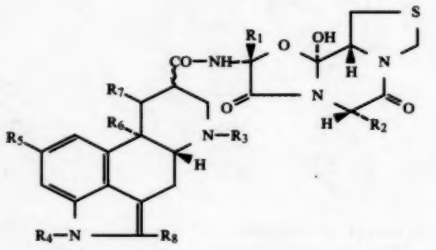
Division of Ser. No. 404,832, Aug. 3, 1982, Pat. No. 4,542,135. This application Jul. 2, 1985, Ser. No. 751,272

Claims priority, application Switzerland, Aug. 7, 1981, 5104/81

Int. Cl.⁴ A61K *31/495;* **C07D** *519/02*

U.S. Cl. 514—250 **10 Claims**

1. A method of inducing vasoconstriction in a subject which comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of formula I.



wherein

R_1 is (C_{1-4})alkyl,

R_2 is (C_{1-6})alkyl or benzyl,

R_3 and R_4 independently are hydrogen or (C_{1-4})alkyl,

R_5 is hydrogen or bromine,

R_6 and R_7 are each hydrogen, or

R_6 and R_7 together form a single bond, or

R_6 is methoxy and R_7 is hydrogen, and

R_8 is hydrogen, methyl, or halogen of atomic number from 9 to 35,

with the proviso that when R_5 is bromine R_7 is hydrogen, in free base form or in pharmaceutically acceptable acid addition salt form.

4,681,881

5-ALKOXY-PYRIDO[4,3-d]PYRIMIDINE DERIVATIVES

Jorgen Kleinschroth, Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch, and Bernd Wagner, Denzlingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

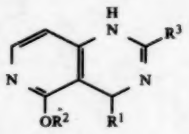
Filed Jan. 21, 1986, Ser. No. 819,961

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502590

Int. Cl.⁴ A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—258 **5 Claims**

1. A compound of the formula or its tautomers



wherein

R^1 is phenyl or phenyl substituted by one or two of the same or different substituents selected from halogen, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino methylthio, trifluoromethyl, and methylenedioxy;

R^2 is a straight or branched alkyl group having one to six carbon atoms;

R^3 is a straight or branched alkyl group having up to six carbon atoms, or phenyl or phenyl substituted by one or more of the same or different substituents selected from halogen, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methylthio, trifluoromethyl, and methylenedioxy, or a pharmocologically acceptable acid addition salt thereof.

4,681,882

4-ALKOXY-PYRIDO[2,3-D]PYRIMIDINE DERIVATIVES

Jörgen Kleinschroth; Gerhard Satzinger, both of Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch; Günter Weinheimer, Denzlingen, and Edgar Fritschi, St. Peter, all of Fed. Rep. of Germany, assignors to Gödecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

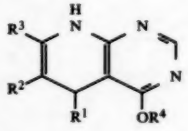
Filed Oct. 16, 1985, Ser. No. 787,844

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438351

Int. Cl.⁴ A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—258 **9 Claims**

1. A compound of the formula



wherein

R^1 is phenyl, pyridyl or thienyl, or phenyl substituted by up to three of the same or different groups selected from a straight or branched alkyl with up to four carbon atoms, halogen, nitro, a straight or branched alkoxy with up to

four carbon atoms, difluoromethoxy, trifluoromethoxy, dialkylamino, alkylthio or trifluoromethyl or a methylenedioxy group;

R^2 represents a nitrile group, a carboxyl group or an alkoxycarbonyl residue with up to six carbon atoms;

R^3 is a straight-chained or branched alkyl group with up to four carbon atoms or an amino group; and

R^4 represents a straight-chained or branched alkyl group with up to four carbon atoms; or a pharmaceutically accepatable salt thereof.

8. A pharmaceutical composition comprising a vasospasmolytically effective amount of a compound as claimed in claim **1** with a pharmaceutically acceptable carrier or diluent.

4,681,883

HISTAMINE H_2-ANTAGONIST OXAZOLE AND THIAZOLE DERIVATIVES AND COMPOSITIONS THEREFOR

Thomas H. Brown, Tewin; Robert C. Mitchell, Hertford; Ian R. Smith, Knebworth, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

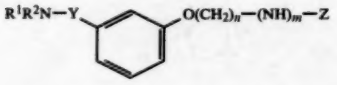
Filed Oct. 17, 1985, Ser. No. 788,261

Claims priority, application United Kingdom, Nov. 3, 1984, 8427878; Jul. 13, 1985, 8517714

Int. Cl.[4] A61K *31/42, 31/425;* **C07D** *413/12, 417/12*

U.S. Cl. 514—212 **19 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

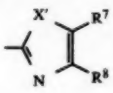
R^1 and R^2 are independently C_{1-4}alklyl; or R^1 and R^2 together with the nitrogen atom to which they are joined represent a pyrrolidino, piperidino or hexahydroazepino ring;

Y is a straight-chain or branched-chain C_{1-4}alkyl;

n is 2 to 5;

m is 1;

Z is:



wherein

X' is oxygen, or sulphur;

R^7 and R^8 are independently hydrogen, C_{1-6}alkyl, phenyl, benzyl, halo, benzyloxy or C_{1-4}alkoxy; or

R^7 and R^8 may be joined to form a benzene ring; said benzene ring being optionally substituted by up to 3 moieties selected from C_{1-6}alkyl, C_{1-6}alkoxy, halo, phenyl, benzyl or benzyloxy;

with the proviso that when X' is oxygen R^7 and R^8 are independently C_{1-6}alkyl, phenyl, hydrogen or benzyl, or are joined to form an optionally substituted benzene ring.

18. A pharmaceutical composition for blocking histamine H_2-receptors which comprises an effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,681,884

DIAZINE-ETHENYLPHENYL OXAMIC ACIDS AND ESTERS AND SALTS THEREOF

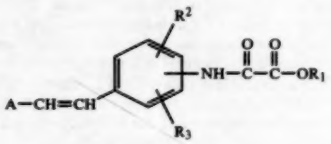
Karl G. Grozinger, Ridgefield, and James T. Oliver, Middlebury, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Continuation-in-part of Ser. No. 528,522, Sep. 7, 1983, abandoned. This application May 10, 1985, Ser. No. 733,007

Int. Cl.[4] A61K *31/505;* **C07D** *239/26, 239/30, 239/34*

U.S. Cl. 514—256 **29 Claims**

1. A compound of the formula



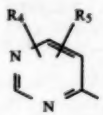
wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_2 is hydrogen, methyl, hydroxyl, alkoxy of 1 to 4 carbon atoms, di(alkyl of 1 to 2 carbon atoms)amino-(alkoxy of 1 to 4 carbon atoms) or halogen;

R_3 is hydrogen or NHCOCOOR$_1$;

A is



R_4 is hydrogen, methyl, alkoxy of 1 to 4 carbon atoms, hydroxyl, amino, alkanoyloxy of 1 to 2 carbon atoms, di(alkyl of 1 to 2 carbon atoms)-amino-(alkoxy of 1 to 4 carbon atoms) or acetamido; and

R_5 is hydrogen, amino, alkoxy of 1 to 4 carbon atoms, halogen or NHCOCOOR$_1$;

or, when R_1 is hydrogen, a nontoxic, pharmaceutically acceptable salt thereof.

28. A composition comprising an effective antiallergic amount of a compound of any of claims **1**, or **2**, and a nontoxic, pharmaceutically acceptable carrier.

4,681,885

5-OXO-PYRIDO[4,3-]PYRIMIDINE DERIVATIVES

Jürgen Kleinschroth, Denzlingen; Karl Mannhardt, Elzach-Oberprechtal; Johannes Hartenstein, Stegen-Wittental; Hartmut Osswald, Waldkirch, and Bernd Wagner, Denzlingen, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

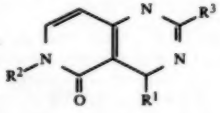
Filed Jan. 21, 1986, Ser. No. 819,958

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1985, 3502742

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

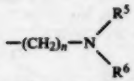
U.S. Cl. 514—258 **5 Claims**

1. A compound of the formula,



wherein $R^1$is phenyl or phenyl substituted in the two and/or three or six position by one or more of the same or different

substitutents selected from halogen, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methythio, trifluoromethyl and methylenedioxy R^2 is hydrogen, a C_1–C_6 alkyl group, a C_1–C_8 alkoxy group, or a C_1–C_8 aminoalkyl group of the formula



R^5 and R^6 may be the same or different and represent a straight or branched alkyl group or together form an alkylene group and n is two or three, R^3 is a straight or branched alkyl group having one to four carbon atoms, phenyl or phenyl substituted by one or more of the same or different substitutents selected from halogen, nitro, C_1–C_4 alkyl C_114 C_4 alkoxy, difluoromethoxy, trifluoromethoxy, dimethylamino, diethylamino, methythio, trifluoromethyl and methylenedioxy, or a pharmacologically acceptable acid addition salt thereof.

4. A pharmaceutical composition comprising a vasospasmolytically effective amount of a compound according to claim 1 together with a pharmacologically acceptable carrier or or diluent.

4,681,886

SUBSTITUTED 4-PHENOXY OR 4-PHENYLTHIO PROLINES

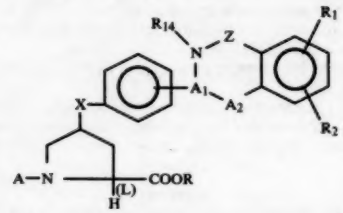
Rudiger D. Haugwitz, Titusville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 373,570, Apr. 30, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,491

Int. Cl.[4] **A61K** *31/505, 31/54;* **C07D** *403/12, 417/12*

U.S. Cl. 514—259 **17 Claims**

1. A compound of the formula

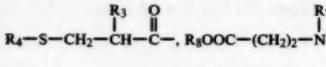


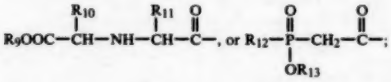
and a physiologically acceptable salt thereof wherein

x is oxygen or sulfur;

$-A_1-A_2-$ is $-CH-NH-$ or $-C=N-$;

A is





R, R_8 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and a physiologically acceptable salt forming ion;

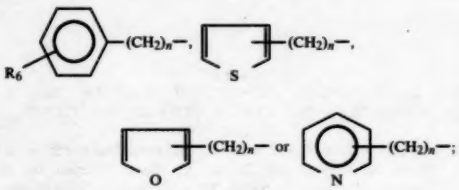
R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, halo substituted lower alkyl, nitro, and $-SO_2NH_2$;

Z is

R_3 is hydrogen, lower alkyl, halo substituted lower alkyl, phenyl, benzyl, phenethyl or cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

R_4 is hydrogen or

R_5 is lower alkyl,

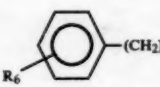


n is zero, one, two, three or four;

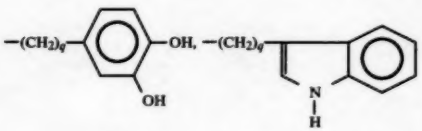
R_6 is hydrogen, lower alkyl, lower alkoxy, halogen, or hydroxy;

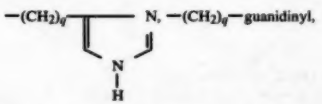
R_7 is lower alkyl or cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

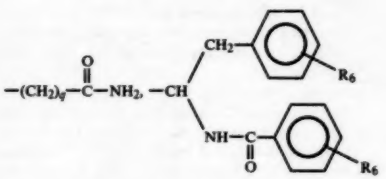
R_{10} is hydrogen, lower alkyl,



halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, $-(CH_2)_q$-N(lower alkyl)$_2$, $-(CH_2)_q$-NH_2, $-(CH_2)_q$-carboxy, $-(CH_2)_q$-SH, $-(CH_2)_q$-S-lower alkyl,

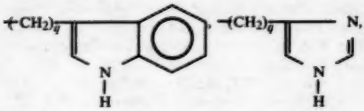


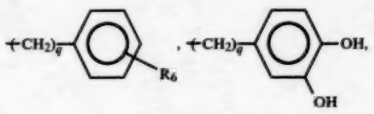


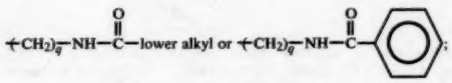


q is one, two, three or four;

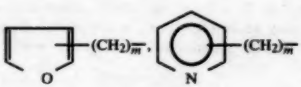
R_{11} is hydrogen, lower alkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q-NH_2$, $-(CH_2)_q-N(\text{lower alkyl})_2$, $-(CH_2)_q$-guanidinyl,







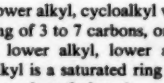
R_{12} is alkyl of 1 to 10 carbons,



cycloalkyl-$(CH_2)_m$- wherein cycloalkyl is a saturated ring of 3 to 7 carbons;

m is zero or an integer from 1 to 7;

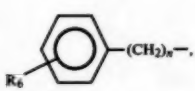
R_{13} is hydrogen, lower alkyl, benzyl, benzhydryl, a physiologically acceptable salt forming ion or



R_{15} is hydrogen, lower alkyl, cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, or phenyl;

R_{16} is hydrogen, lower alkyl, lower alkoxy, cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, phenyl, benzyl, or phenethyl; and

R_{14} is hydrogen, lower alkyl, cycloalkyl-$(CH_2)_n$— wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q-N(\text{lower alkyl})_2$, or $-(CH_2)_q-NH_2$.

4,681,887

PHARMACEUTICAL COMPOSITIONS WITH A NEUROLEPTIC ACTION AND PROCESS FOR PREPARING SAME

Gábor Megyeri; Tibor Keve; Béla Stefkó; Erik Bogsch; János Galambos; Anna Kassainée Zieger; Ferenc Trischler; Éva Pálosi; Dóra Groó; Egon Kárpáti; Zsolt Szombathelyi; László Szporny, all of Budapest; Béla Kiss, Vecsés; István Laszlovszky, and Erzsébet Lapis, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

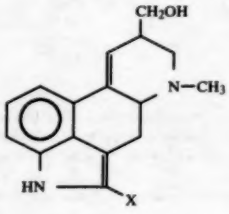
Filed Jun. 23, 1986, Ser. No. 877,298

Claims priority, application Hungary, Jun. 21, 1985, 2445/85

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—284 **7 Claims**

1. A method of treating a psychiatric disease responsive to a dopaminergic antagonistic effect in a mammalian subject needing said treatment which comprises the step of administering to said mammalian subject a therapeutically effective amount of a compound of the Formula (I)



(I)

wherein X is chloro, bromo, or iodo; or a pharmaceutically acceptable acid addition salt thereof.

4,681,888

THIENOPYRIDINE DERIVATIVES AND ANTI-THROMBOTIC COMPOSITIONS CONTAINING THE SAME

Andre Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, Paris, France

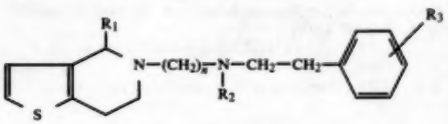
Continuation-in-part of Ser. No. 792,484, Oct. 29, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 894,780

Claims priority, application United Kingdom, Nov. 16, 1984, 8429087

Int. Cl.[4] A61K *31/44*; C07D *495/04*

U.S. Cl. 514—301 **2 Claims**

1. A derivative of 5-(ω-phenethylamino-alkyl)-4,5,6,7-tetrahydro-thieno-(3,2-c)-pyridine of the formula



wherein n is an integer of from 2 to 5, R_1 represents a hydrogen atom or a 3,4-dimethoxyphenyl group, R_2 represents a hydrogen atom, an alkyl group having up to 4 carbon atoms or a 4-cyano-4-(3,4-dimethoxyphenyl)-5-methylhexyl group and R_3 represents two or three methoxy groups; and therapeutically acceptable salts thereof.

2. An anti-thrombotic therapeutic composition of matter containing, as an active ingredient therein, an anti-thrombotically effective amount of a compound according to claim 1 in admixture with a therapeutically acceptable diluent or carrier.

4,681,889
METHOD FOR TREATING CARDIOVASCULAR DISEASE WITH CALCIUM CHANNEL ANTAGONISTS

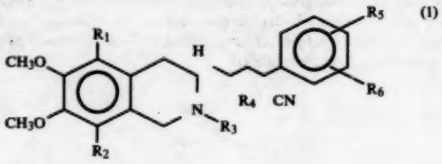
Robin Clark, Palo Alto; Joseph M. Muchowski, Sunnyvale; Fang-Ting Chiu, Union City; John O. Gardner, Los Altos, and Jacob Berger, Los Altos Hills, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 803,464, Dec. 2, 1985, Pat. No. 4,613,606. This application Jun. 27, 1986, Ser. No. 879,689

Int. Cl.[4] A61K *31/47*; C07D *217/20*

U.S. Cl. 514—307 5 Claims

1. A method for treating cardiovscular diseases susceptible to treatment with calcium channel blockers, which method comprises administering an effective amount of a compound of formula 1 to a mammal in need thereof



(I)

wherein

R_1 and R_2 are each independently —H or lower alkoxy;

R_3 and R_4 are each independently lower alkyl; and

R_5 and R_6 are each —OCH_3, or together form —OCH_2O— or —OCH_2CH_2O—;

and pharmaceutically acceptable acid addition salts thereof.

4,681,890
3,4-DIHYDROBENZOPYRAN COMPOUNDS AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Koichi Kanehira; Manzo Shiono; Yoshiji Fujita; Takashi Nishida, all of Kurashiki, and Johji Yamahara, Otsu, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

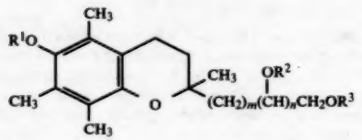
Filed Oct. 23, 1985, Ser. No. 790,670

Claims priority, application Japan, Oct. 30, 1984, 59-229367; Mar. 4, 1985, 60-43380

Int. Cl.[4] C07D *405/12*; A61K *31/455*

U.S. Cl. 514—333 12 Claims

1. A 3,4-dihydrobenzopyran compound of the formula:



(I)

wherein R^1, R^2 and R^3 are each hydrogen or nicotinoyl group and at least one of them is nicotinoyl group, m is an integer of 0, 1 or 2, and n is an integer of 0 or 1.

4,681,891
DIHYDRO-2,6-DIMETHYL PYRIDINES, FORMULATIONS AND METHOD OF USE FOR TREATING ANGINA PECTORIS, HIGH BLOOD PRESSURE OR DISTURBANCES OF CEREBRAL OR PERIPHERAL BLOOD FLOW

Karl Schönafinger, Alzenau; Helmut Bohn, Schöneck; Piero Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Fed. Rep. of Germany

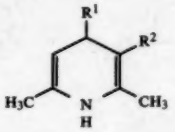
Filed Nov. 12, 1985, Ser. No. 796,806

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443179

Int. Cl.[4] C07D *413/04*, *417/04*; A61K *31/44*

U.S. Cl. 514—340 8 Claims

1. A 1,4-dihydropyridine of the formula



wherein R^1 is a phenyl radical unsubstituted or optionally substituted with one or two identical or different substituents selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, trifluoro-methyl, nitro, cyano and benzyloxy groups, R^2 is a radical selected from the group consisting of 1,2,4-oxadiazole, 1,3,4-oxadiazole, 1,2,4-thiadiazole and 1,3,4-thiadiazole radicals which are either unsubstituted or substituted with a radical selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, aralkyl having 7 to 9 carbon atoms, alkoxyalkyl having a total of 2 to 5 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, amino-carbonylmethylthio, methoxy carbonyl, ethoxycarbonyl and phenyl, and salts thereof with pharmacologically acceptable acids.

4,681,892
ISOXAZOLIDINE INSECTICIDES AND FUNGICIDES

Axel Ingendoh, Velbert; Wolfgang Scheinert, Leverkusen; Benedikt Becker, Mettmann; Kurt Halcour, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

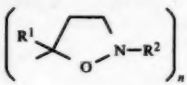
Filed Feb. 27, 1986, Ser. No. 834,169

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509547

Int. Cl.[4] A61K *31/42*; C07D *261/02*

U.S. Cl. 514—378 10 Claims

1. An isoxazolidine of the formula



A

in which

n is 2 or 3,

R^1 is H or C_{1-4}-alkyl,

R^2 is C_{1-10}-alkyl, optionally substituted by C_{3-6}-cycloalkyl; or is C_{3-6}-cycloalkyl, optionally substituted by C_{1-10}-alkyl or C_{3-6}-cycloalkyl,

A is a di- or trivalent phenyl radical which is optionally substituted by C_{1-4}-alkyl.

9. A method of combating insects, arachnids or fungi which comprises applying thereto or to a habitat thereof an insecticidally, arachnicidally or fungicidally effective amount of a compound according to claim 1.

4,681,893

TRANS-6-[2-(3- OR 4-CARBOXAMIDO-SUBSTITUTED PYRROL-1-YL)ALKYL]-4-HYDROXYPYRAN-2-ONE INHIBITORS OF CHOLESTEROL SYNTHESIS

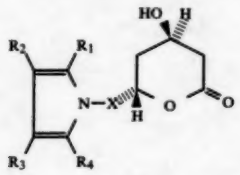
Bruce D. Roth, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 30, 1986, Ser. No. 868,867

Int. Cl.[4] **A61K** *31/40, 31/35;* **C07D** *207/327*

U.S. Cl. 514—422 **9 Claims**

1. A compound of structural formula I



I

wherein

X is $—CH_2—$, $—CH_2CH_2—$, $—CH_2CH_2CH_2—$, or $—CH_2CH(CH_3)—$;

R_1 is
- 1-naphthyl;
- 2-naphthyl;
- cyclohexyl;
- norbornenyl;
- phenyl;
- phenyl substituted with
  - fluorine,
  - chlorine,
  - bromine,
  - hydroxyl,
  - trifluoromethyl,
  - alkyl of from one to four carbon atoms,
  - alkoxy of from one to four carbon atoms, or
  - alkanoyloxy of from two to eight carbon atoms;

either of R_2 or R_3 is $—CONR_5R_6$ where R_5 and R_6 are independently
- hydrogen;
- alkyl of from one to six carbon atoms;
- phenyl;
- phenyl substituted with
  - fluorine,
  - chlorine,
  - bromine,
  - cyano,
  - trifluoromethyl, or
  - carboalkoxy of from three to eight carbon atoms;

and the other of R_2 or R_3 is
- hydrogen;
- alkyl of from one to six carbon atoms;
- cyclopropyl;
- cyclobutyl;
- cyclopentyl;
- cyclohexyl;
- phenyl; or
- phenyl substituted with
  - fluorine,
  - chlorine,
  - bromine,
  - hydroxyl,
  - trifluoromethyl,
  - alkyl of from one to four carbon atoms,
  - alkoxy of from one to four carbon atoms, or
  - alkanoyloxy of from two to eight carbon atoms;

R_4 is
- alkyl of from one to six carbon atoms;
- cyclopropyl;
- cyclobutyl;
- cyclopentyl;
- cyclohexyl; or
- trifluoromethyl;

or a hydroxy acid or pharmaceutically acceptable salts thereof, corresponding to the opened lactone ring of the compounds of structural formula I above.

8. A pharmaceutical composition, useful as a hypocholesterolemic agent, comprising a hypocholesterolemic effective amount of a compound in accordance with claim 1 in combination with a pharmaceutically acceptable carrier.

9. A method of inhibiting cholesterol biosynthesis in a patient in need of such treatment by administering a pharmaceutical composition as defined by claim 8.

4,681,894

HYDROXAMIC ACIDS AND ESTERS

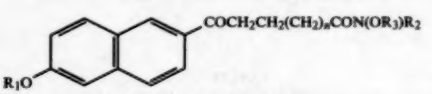
William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 26, 1986, Ser. No. 912,901

Int. Cl.[4] **C07C** *83/10;* **A61K** *31/085, 31/185, 31/21*

U.S. Cl. 514—507 **14 Claims**

1. A compound of the formula



I

where

R_1 is C_{1-12} alkyl, C_{3-12} branched-chain alkyl, C_{2-6} alkenyl, C_{3-6} alkynyl or aralkyl wherein the alkyl group of the aralkyl is a C_{1-3} alkyl and wherein the aralkyl group is unsubstituted or substituted with a C_{1-2} alkyl or hydroxyalkyl wherein the alkyl group is C_{1-6};

R_2 is H, C_{1-10} alkyl, C_{3-10} branched-chain alkyl, C_{5-7} cycloalkyl, phenyl or phenyl substituted with C_{1-3} alkyl or C_{1-3} alkoxy;

R_3 is H or C_{1-3} alkyl; and

$(CH_2)_n$ is a straight- or branched-alkyl chain wherein n is 0–5.

9. A pharmaceutical composition for topical, oral, parenteral and aerosol administration, comprising an effective amount of a compound according to claim 1 as the active ingredient dispersed in a pharmaceutically acceptable carrier.

4,681,895

NOVEL GUANIDINOMETHYLCYCLOHEXANECARBOXYLIC ACID COMPOUNDS AND ANTI-ULCER DRUG CONTAINING THE SAME

Toshio Satoh, Tokushima, and Goro Tsukamoto, Toyonaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

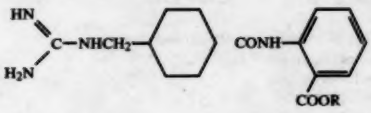
Filed Mar. 6, 1986, Ser. No. 836,711

Claims priority, application Japan, Jun. 8, 1985, 60-47236

Int. Cl.[4] **A61K** *31/245;* **C07C** *129/00*

U.S. Cl. 514—535 **6 Claims**

1. An N-phenyl-trans-4-guanidinomethylcyclohexanecarboxamide compound of the formula:



wherein R is hydrogen atom or a lower alkyl group, and a pharmaceutically acceptable salt thereof.

4,681,896

PHARMACEUTICAL AND DIETARY COMPOSITION

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, Surrey, England

Filed Jan. 31, 1984, Ser. No. 575,744

Claims priority, application United Kingdom, Feb. 1, 1983, 8302708

Int. Cl.[4] A61K *31/23*

U.S. Cl. 514—552 **14 Claims**

1. A method of treating an atopic disorder wherein

(1) an effective amount of a metabolite of linoleic acid selected from the group consisting of GLA, DGLA, AA a 22:4n−6 essential fatty acid and a 22:5 n−6 essential fatty acid, and

(2) an effective amount of a metabolite of alpha-linolenic acid selected from the group consisting of 18:4n−3, 20:4n−3, 20:5n−3, 22:5n−3 and 22:6n−3 essential fatty acids,

are administered alone or in an acceptable pharmaceutical carrier or diluent to a person suffering from said disorder.

4,681,897

PHARMACEUTICAL PRODUCTS PROVIDING ENHANCED ANALGESIA

Larry M. Brand, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

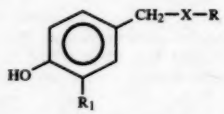
Division of Ser. No. 571,043, Jan. 16, 1984, abandoned. This application Dec. 24, 1984, Ser. No. 684,642

Int. Cl.[4] A61K *31/19, 31/16*

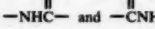
U.S. Cl. 514—557 **15 Claims**

1. An analgesic composition comprising a safe and effective amount of:

(a) a capsaicinoid analgesic compound of the general formula:



wherein R_1 is selected from the group consisting of OH and OCH_3, X is selected from the group consisting of



and R is a C_{16}–C_{21} cis-monounsaturated alkenyl;

(b) a nonsteroidal analgesic selected from the group consisting of ibuprofen, naproxen, ketoprofen, fenaprofen, suprofen, flurbiprofen, benoxaprofen, perprofen, and carprofen; and

(c) a pharmaceutically-acceptable carrier; wherein the weight ratio of (a):(b) is from about 20:1 to about 1:20.

4,681,898

N-N-DISUBSTITUTED ALKENAMIDES AND PHENYLALKENAMIDES

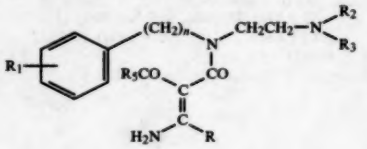
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

Continuation-in-part of Ser. No. 505,804, Jun. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 330,601, Dec. 14, 1981, abandoned. This application May 8, 1984, Ser. No. 608,126

Int. Cl.[4] C07C *103/22*

U.S. Cl. 514—619 **13 Claims**

1. A compound of the formula



where

n is 0 or 1;

R is lower alkyl, or

R_2 and R_3 are each, independently, lower alkyl,

R_1 and R_4 are each, independently, hydrogen, halo having an atomic weight of 19 to 36, lower alkyl or lower alkoxy, and

R_5 is hydrogen or alkyl of 1 to 6 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

12. A method for treating diabetes which comprises administering to an animal in need of said treatment a hypoglycemic effective amount of a compound of claim 1.

4,681,899

METHOD OF PREVENTING THE GROWTH OF MALARIA PARASITES IN ERYTHROCYTES

S. Tsuyoshi Ohnishi, 4220 Pine St., Philadelphia, Pa. 19104

Filed Mar. 29, 1985, Ser. No. 717,978

Int. Cl.[4] A61K *31/18, 31/135*

U.S. Cl. 514—602 **5 Claims**

1. A method of inhibiting the growth of malaria parasites in a malaria victim comprising administering to said victim in a concentration sufficient enough to inhibit the growth of malaria parasites of a material selected from the group consisting of 1-propranolol; 1-, d-propranolol, 1-aiprenolol and N-(6-aminohexyl)-5-chloro-1-naphthalenesulfonamide.

4,681,900

BIOCIDE ACTIVATOR

Tetsuji Iwasaki, Wakayama, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,904

Claims priority, application Japan, Jan. 13, 1984, 59-4569

Int. Cl.[4] A01N *25/00, 25/02*; C11C *3/00*

U.S. Cl. 514—786 **17 Claims**

1. A composition comprising (A) a carrier, (B) an effective amount of a biocide or plant growth regulator, and (C) from 0.1 to 5 parts by weight, per 1 part by weight of (B), of an activator which is a polymeric composition prepared by a process of adding (1) an alkylene oxide selected from the group consisting of (a) propylene oxide and (b) both of propylene oxide and ethylene oxide, to (2) a mixture of at least one fatty

acid triglyceride and at least one polyhydric alcohol, the molar ratio of triglyceride/polyhydric alcohol in said mixture being in the range of from 1/0.2 to 1/2, the addition of said alkylene oxide (1) to said mixture (2) being performed under conditions effective to cause polymerization addition of said alkylene oxide (1) with said mixture (2) to form said polymeric composition, the amount of propylene oxide added to said mixture being in the range of from 1 to 100 mols per 1 mol of the sum of the number of mols of triglyceride and polyhydric alcohol in said mixture.

4,681,901

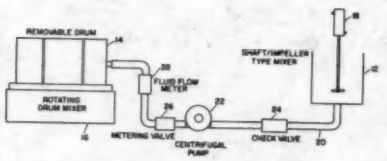
NEOPRENE FOAM OF INCREASED CONTINUOUS VOLUME

F. Paul Gavin, Mason, N.H.; David F. Brigham, Elliottsville Plantation, Me., and Ann H. Gavin, Mason, N.H., assignors to ModuForm, Inc., Fitchburg, Mass.

Filed Apr. 25, 1986, Ser. No. 856,295

Int. Cl.[4] C08J *9/24*

U.S. Cl. 521—54 **31 Claims**



1. A process for manufacturing neoprene structures, which consists essentially of:

(a) chopping neoprene foam into pieces;

(b) mixing the chopped neoprene foam with an neoprene latex adhesive;

(c) forming the neoprene mixture into a desired shape and structure and providing means by which said neoprene mixture can retain said shape and structure; and

(d) drying the mixture.

4,681,902

FLAME RETARDANT PHENOLIC FOAMS

Alexander W. S. Duncan, Epsom, England; David G. Summers, Gwent, and Kenneth C. Thomas, South Glamorgan, both of Wales, assignors to BP Chemicals Limited, London, England

Filed Nov. 3, 1986, Ser. No. 926,992

Claims priority, application United Kingdom, Nov. 16, 1985, 8528294

Int. Cl.[4] C08J *9/14*

U.S. Cl. 521—85 **10 Claims**

1. A flame retardant resole foam having a k value below 0.020 W/m k said foam having incorporated therein a flame retardant comprising:

(i) a halo-substituted diphenyl oxide with or without additional hydrocarbyl substituents in the phenyl nuclei, and

(ii) an organic phosphorus compound.

4,681,903

POLYESTER POLYOLS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE IN THE ISOCYANATE POLYADDITION PROCESS

Peter Haas, Haan; Hans-Ulrich Weber, Monheim; Claus-Dieter Sommerfeld, Much; Manfred Giersig, Cologne, and Rolf Wiedermann, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

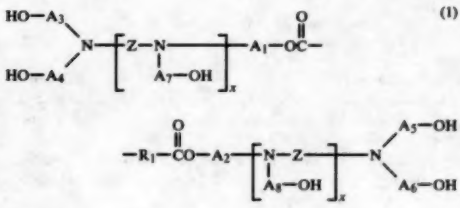
Filed Aug. 4, 1986, Ser. No. 892,978

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530360; Sep. 10, 1985, 3532140; Mar. 20, 1986, 3609361

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—167 **19 Claims**

1. A polyester polyol corresponding to the formula



in which

R_1 represents a bond or a difunctional radical,

Z represents a difunctional straight chain or branched C_2–C_6 alkylene radical,

X represents 0 or 1,

A_1, A_2, A_3, A_4, A_5, A_6, A_7, and A_8 which may be the same or different, each represents a difunctional straight-chain or branched alkylene radical containing from 2 to 6 carbon atoms

with at least 20% of the radicals A_3, A_4, A_5 and A_6 being a secondary CH group and greater than 75% of the radicals A_1 and A_2 being straight-chain alkylene ester groups

which polyester polyol has an OH number of from 200 to 700 and a viscosity less than 90,000 mPa.s/25° C.

4,681,904

EPOXY RESIN COMPOSITION

Kazuo Yasuda; Toshiharu Ando; Yoshifumi Itabashi, and Masaru Tsuchihashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

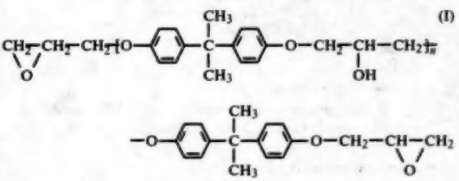
Filed Mar. 25, 1986, Ser. No. 843,754

Claims priority, application Japan, Apr. 10, 1985, 60-74355

Int. Cl.[4] C08G *59/06, 59/42;* C08L *63/02*

U.S. Cl. 523—457 **2 Claims**

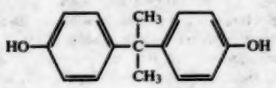
1. An epoxy resin composition which comprises an epoxy resin prepared by mixing under heating 100 parts by weight of an epoxy resin having an epoxy equivalent of 200 or below with 0.5–10 parts by weight of a phenoxy resin having Formula (I):



where n is approximately 100; a curing agent; and an inorganic filler;

wherein the curing agent is a condensation product of 100

parts by weight of a polybasic carboxylic acid anhydride and 40–60 parts by weight of bisphenol A having Formula (II):



(II)

4,681,905

STABILIZER COMPOSITIONS FOR SYNTHETIC RESINS IMPARTING IMPROVED LIGHT STABILITY

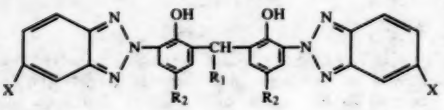
Naohiro Kubota, Ageo, and Atsushi Nishimura, Saitama, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,372
Claims priority, application Japan, Nov. 7, 1984, 59-234373
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 **36 Claims**

1. A stabilizer composition for improving the resistance of synthetic resins to deterioration when exposed to ultraviolet light, comprising

(1) a 2,2,6,6-tetramethyl-piperidyl compound containing in the molecule at least one 2,2,6,6-tetramethyl-piperidyl group; and

(2) an alkylidene-bis-(benzotriazolyl phenol) having the formula:



wherein:

R_1 is hydrogen or alkyl having from one to about twelve carbon atoms;

R_2 is alkyl having from one to about twelve carbon atoms or arylalkyl having from seven to about sixteen carbon atoms;

X is selected from the group consisting of hydrogen, halogen, alkyl having from one to about twelve carbon atoms, aryl having from six to ten carbon atoms, arylalkyl having from seven to about sixteen carbon atoms, alkoxy having from one to about twelve carbon atoms, aryloxy having from six to ten carbon atoms; and arylalkoxy having from seven to about sixteen carbon atoms.

4,681,906

POLYPHENYLENE COMPOSITIONS CONTAINING SULFONATE HAVING IMPROVED MELT BEHAVIOR

Visvaldis Abolins, and Thomas A. Morelli, both of Delmar, N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Nov. 1, 1985, Ser. No. 794,203
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] C08L 71/04
U.S. Cl. 524—166 **8 Claims**

1. A thermoplastic composition having improved melt behavior consisting essentially of:

(a) a polyphenylene ether resin having an intrinsic viscosity less than approximately, 0.42 dl/g as measured in chloroform at 25° C.; and

(b) a compound of the formula R—SO_3X wherein R represents an alkyl or aralkyl radical having 5 to 25 carbon atoms and X represents an alkali metal ion, in an amount effective for improving the melt behavior of said polyphenylene ether resin.

4,681,907

STABILIZERS FOR HALOGEN-CONTAINING ORGANIC POLYMERS COMPRISING AN ORGANOTIN MERCAPTIDE AND A DIESTER OF AN UNSATURATED DICARBOXYLIC ACID

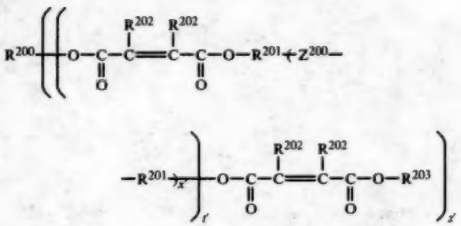
Keith A. Mesch, and Gary M. Conroy, both of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 673,470, Nov. 20, 1984, Pat. No. 4,593,059. This application Sep. 20, 1985, Ser. No. 777,131
Int. Cl.[4] C08K 5/58
U.S. Cl. 524—180 **27 Claims**

1. A composition capable of stabilizing halogen-containing organic polymers against the deteriorative effects of heat, light and weathering, said composition comprising the product produced by combining:

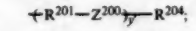
A. an organotin compound or mixture of organotin compounds selected from the group consisting of organotin sulfides, organotin mercaptides, organotin carboxylates, and mixtures thereof; and

B. in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, an essentially non-lubricating diester of a C_1–C_{10} alcohol and an ethylenically unsaturated dicarboxylic acid having one carboxyl group on each carbon atom of the ethenylene group said diester having the formula:



where:

R^{200} and R^{203} each have from 1 to 10 carbon atoms and are at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, multivalent hydrocarbyl group having a valence equal to z', multivalent hydroxyl substituted hydrocarbyl group having a valence equal to z', and

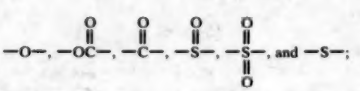


R^{201} is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and multivalent hydroxyl-substituted hydrocarbyl group;

R^{202} is at each independent occurrence selected from hydrogen, alkyl and alkylene;

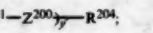
R^{204} is at each independent occurrence selected from hydrogen and alkyl;

Z^{200} is at each independent occurrence selected from



t' is zero or an integer from 1 to about 20;

x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R^{200} is

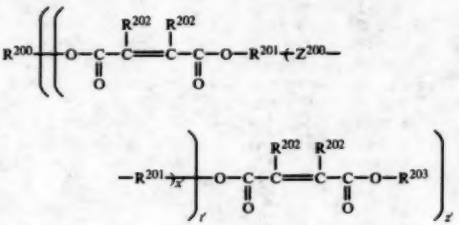


y' is an integer from 1 to 10; and
z' is an integer from 1 to 4.

26. A composition comprising a halogen-containing organic polymer and, in an amount sufficient to stabilize said polymer against the deteriorative effects of heat, light and weathering, a stabilizer composition comprising the product produced by combining:

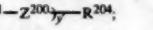
A. an organotin compound or mixture of organotin compounds selected from the group consisting of organotin sulfides, organotin mercaptides, organotin carboxylates and mixtures thereof; and

B. in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, an essentially non-lubricating diester of C_1 to C_{10} alcohol and an ethylenically unsaturated dicarboxylic acid having one carboxyl group on each carbon atom of the ethenylene group, said diester having the formula:

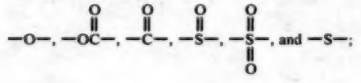


where:

R^{200} and R^{203} each have from 1 to 10 carbon atoms and are at each independent occurrence selected from alkyl, alkenyl, cycloalkyl, cycloalkenyl, multivalent hydrocarbyl group having a valence equal to z', multivalent hydroxyl substituted hydrocarbyl group having a valence equal to z', and



R^{201} is at each independent occurrence selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, a multivalent hydrocarbyl group and multivalent hydroxyl-substituted hydrocarbyl group;
R^{202} is at each independent occurrence selected from hydrogen, alkyl and alkylene;
R^{204} is at each independent occurrence selected from hydrogen and alkyl;
Z^{200} is at each independent occurrence selected from



t' is zero or an integer from 1 to about 20;
x' is zero or an integer from 1 to about 20 with the proviso that if x'=0 or t'=0 then R^{200} is

y' is an integer from 1 to 10; and
z' is an integer from 1 to 4.

4,681,908

HARD ORGANOPOLYSILOXANE RELEASE COATING

Dennis W. Broderick, Rhodes, and Harold L. Vincent, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 550,168, Nov. 9, 1983, Pat. No. 4,585,705. This application Oct. 31, 1985, Ser. No. 793,411
The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.
Int. Cl.[4] C08K *5/54;* **C08G** *77/16*
U.S. Cl. 524—268 **8 Claims**

1. A composition of matter comprising

(A) 100 parts by weight of a hydroxyfunctional polysiloxane resin copolymer containing $CH_3SiO_{3/2}$ units, $C_6H_5SiO_{3/2}$ units, $(C_6H_5)_2SiO$ units and $C_6H_5(CH_3)SiO$ units wherein there is present 0.5 to 5 weight percent hydroxy radicals attached to silicon atoms, the organic group to silicon ratio is from 0.8 to 1.4 and the C_6H_5— to silicon ratio is from 0.35 to 0.85;

(B) from 4 to 240 parts by weight, based on 100 parts of (A), of $CH_3SiO_{3/2}$; and

(C) from 0.2 to 6 parts by weight, based on 100 parts of (A), of a fluid polysiloxane having the formula $(RR'R''Si)_2O[(CH_3)_2SiO]_x$, wherein x has a value of from 250 to 850, R is OH or CH_3— and R' and R'' are CH_3—, wherein there is present in component (C), less than fifteen percent by weight of $(CH_3)_3SiO$ units.

4,681,909

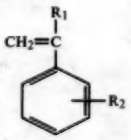
ROSIN EMULSION SIZING AGENT

Koji Ohta; Masaaki Yoshimura, both of Chiba, and Mizunori Takahashi, Ichihara, all of Japan, assignors to Dic-Hercules Chemicals, Inc., Tokyo, Japan

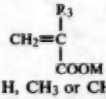
Filed Oct. 22, 1985, Ser. No. 790,212
Claims priority, application Japan, Oct. 26, 1984, 59-224065
Int. Cl.[4] C08L *93/04*
U.S. Cl. 524—272 **3 Claims**

1. A rosin emulsion sizing agent comprising 20 to 50% by weight of fortified rosin, 2 to 30% by weight of an anionic saponification product of a styrene/acrylic acid copolymer or a styrene/methacrylic acid copolymer, and water.

2. The sizing agent of claim 1 wherein the styrene/acrylic acid copolymer or styrene/methacrylic acid copolymer is a copolymer composed of 80 to 20% by weight of at least one monomer represented by the general formula



wherein R_1 represents H or CH_3 and R_2 represents H, CH_3, CH_2CH_3, $CH(CH_3)_2$, or $C(CH_3)_2$, 20 to 60% by weight of at least one monomer represented by the general formula



wherein R_3 represents H, CH_3 or CH_2COOH, and M represents H, Li, Na, K or NH_4, and 0 to 40% by weight of at least one monomer represented by the general formula

wherein R_4 represents H or CH_3, and R_5 represents CN, $OCOCH_3$, $COOCH_3$, $COOC_2H_5$, $COOC_3H_7$, $COOC_4H_9$, $COOC_8H_{17}$, $COOC_{12}H_{25}$, $CONH_2$, $CONHCH_3$, $CON(CH_3)_2$ or $COOCH_2CH_2OH$.

4,681,910

AQUEOUS WATER-REPELLENT COATINGS

William B. Crockatt, Mississauga, and John Rimma, Oakville, both of Canada, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 13, 1986, Ser. No. 818,036

Int. Cl.[4] C08L *23/04, 33/06, 91/04, 91/06*

U.S. Cl. 524—487 **14 Claims**

1. An aqueous coating composition which dries to provide a continuous film from which a wax will slowly and progressively exude to provide a water-repellent surface that confers long-term water resistance consisting essentially of from about 5 percent to about 50 percent of an aqueous wax dispersion including at least about 30 percent of a petroleum wax, at least about 10 percent of a polyethylene wax and an amount of a surfactnat sufficient to stabilize the dispersion; and from about 50 percent to about 95 percent of an aqueous emulsion of copolymerized monoethylenically uhsaturated monomers having a sufficiently low glass transition temperature to coalesce on air drying, said proportions being by weight of solids based on the total solids not including any pigment, thickener, preservative or defoamer which may be present.

4,681,911

REINFORCED COMPOSITES

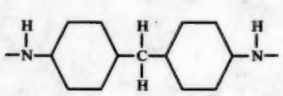
Ike Y. Chang, West Chester, Pa., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1986, Ser. No. 819,562

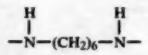
Int. Cl.[4] C08K *7/14;* **C08L** *77/00*

U.S. Cl. 524—607 **4 Claims**

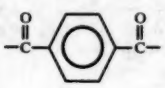
1. A composite comprising a matrix formed of a copolyamide of the following units:



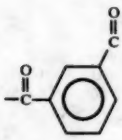
20–50 mol % I



50–80 mol % II



30–50 mol % and III



50–70 mol % IV

with units I and II constituting 100 mol % of the diamino radical and units III and IV constituting 100 mol % of the diacid units, reinforced with from about 30 to 70% by volume of continuous filaments selected from the group of glass, carbon and p-aramid filaments.

4,681,912

PROCESS FOR MANUFACTURING INVERSE MICROLATICES OF WATERSOLUBLE COPOLYMERS, THE RESULTANT INVERSE MICROLATICES AND THEIR USE FOR IMPROVING THE PRODUCTION OF HYDROCARBONS

Jean-Pierre Durand, Chatou; Denise Nicolas, Maurepas; Norbert Kohler, Saint Germain en Laye; Francois Dawans, Bougival, and Francoise Candau, Strasbourg, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 7, 1985, Ser. No. 742,445

Claims priority, application France, Jun. 7, 1984, 84 08906; Jun. 7, 1984, 84 08907

Int. Cl.[4] C08J *0/00*

U.S. Cl. 524—827 **13 Claims**

1. A process for producing a stable inverse microlatex comprising the steps of:

(a) admixing:

an aqueous solution containing at least one acrylic monomer (i) selected from acrylamide and methacrylamide and at least another acrylic monomer (ii) selected from acrylic acid, methacrylic acid and alkali salts of said acids, at a concentration from 20 to 80% by weight in said aqueous solution;

an oily phase comprising at least one hydrocarbon liquid, the ratio by weight between said aqueous solution and said oily phase being from 0.5/1 to 3/1, and

a non-ionic surfactant or a non-ionic surfactant mixture having a H L B from 8 to 11, in a proportion, with respect to all the involved constituents, higher than about a value y, given, in percent by weight, by the relationship:

$$y = 5.8\,X^2 - 110\,X + 534$$

wherein X is the H L B of said surfactant or said surfactant mixture, so as to form an inverse microemulsion, and

(b) subjecting the inverse microemulsion obtained in step (a) to copolymerization conditions.

4,681,913

METHOD FOR PREVENTING PREMATURE CURING OF SILICONE COMPOSITIONS AND COMPOSITIONS MADE THEREBY

Edwin R. Evans, Clifton Park, and Arnold Torkelson, Burnt Hills, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 741,374, Jun. 5, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 898,784

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—862 **18 Claims**

1. In a curable silicone composition comprising:

I. a first package comprising:

(a) an olefin-containing polydiorganosiloxane, and

(b) a precious metal or precious metal containing hydrosilation catalyst, and

II. a second package comprising:

(c) an organohydrogenpolysiloxane crosslinking agent, the improvement comprising including in said second package from about 0.05 to about 3.0 parts by weight of Lewis base to substantially neutralize any Lewis acid present in said second package which was generated in situ.

4,681,914

SOLID CAST DETERGENTS CONTAINING ENCAPSULATED HALOGEN BLEACHES AND METHODS OF PREPARATION AND USE

Keith E. Olson, Apple Valley, and Kent R. Brittain, Eagan, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 728,748, Apr. 30, 1985. This application May 8, 1986, Ser. No. 861,064

Int. Cl.[4] C11D 7/06, 7/56, 11/00, 17/00

U.S. Cl. 252—91 33 Claims

1. A solid, cast detergent-bleach composition, comprising:

(a) at least 30 wt-%, based upon the composition, alkaline hydratable chemical;

(b) an effective amount of a hardness-sequestrant wherein the hardness-sequestrant is different than the alkaline hydratable chemical;

(c) about 0 to 15 wt-%, based upon the composition, polyelectrolyte wherein the polyelectrolyte is different than the alkaline hydratable chemical and the hardness-sequestrant;

(d) at least 5 wt-%, based upon the alkaline hydratable chemical, water of hydration; and

(e) about 0.5 to 25 wt-%, based upon the composition, randomly dispersed encapsulated bleach particles, comprising:

(i) about 20 to 90 wt-%, based upon the encapsulated bleach particles, core which comprises a source of active-halogen bleach;

(ii) about 0 to 50 wt-%, based upon the encapsulated bleach particles, first coating which comprises a soluble inorganic coating agent; and

(iii) about 10 to 80 wt-%, based upon the encapsulated bleach particles, second coating which comprises a synthetic detergent.

17. A process for forming a substantially uniform solid cast detergent-bleach composition, comprising the steps of:

(a) heating about 20 to 75 wt-%, based upon the composition, of a 40 to 80 wt-% aqueous solution of an alkali metal hydroxide to about 50° to 95° C.;

(b) substantially uniformly distributing into the aqueous caustic solution:

(i) an effective amount of a wash water hardness sequestrant;

(ii) about 0 to 15 wt-%, based upon the composition, polyelectrolyte which is different than the hardness-sequestrant;

(iii) about 10 to 60 wt-%, based upon the composition, alkaline hydratable chemical which is different than the hardness-sequestrant and the polyelectrolyte; and

(iv) about 0.5 to 25 wt-%, based upon the composition, encapsulated bleach particles comprising:

(A) about 20 to 90 wt-%, based upon the encapsulated bleach particles, core which comprises a source of active-halogen bleach;

(B) about 0 to 50 wt-%, based upon the encapsulated bleach particles, first coating which comprises a soluble inorganic coating agent; and

(C) about 10 to 80 wt-%, based upon the encapsulated bleach particles, second coating which comprises a synthetic detergent; to form a liquid detergent-bleach composition; and

(c) allowing the liquid detergent-bleach composition to thicken and solidify.

4,681,915

IMPACT MODIFIED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS

Gary M. Bates, Voorheesville; Gregory R. Chambers, and Sai-Pei Ting, both of Delmar, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,808

Int. Cl.[4] C08L 71/04

U.S. Cl. 525—148 16 Claims

1. A thermoplastic resin composition comprising:

a. a base resin comprising a compatible combination of a polyphenylene ether resin and a polyamide resin; and

b. a property improving amount of an impact modifying agent core-shell structure consisting essentially of of a crosslinked acrylate core and an interpenetrating, crosslinked styrenic shell wherein the agent is prepared by polymerization a styrene with polyethylenically unsaturated cross-linking agent in the presence of the crosslinked acrylate core.

4,681,916

POLY (VINYL CHLORIDE) COMPOSITIONS

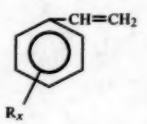
Muyen M. Wu, Hudson; George S. Li, Solon, and Elmer J. Dewitt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1986, Ser. No. 859,517

Int. Cl.[4] C08L 27/06

U.S. Cl. 525—210 16 Claims

1. A composition comprising an intimate admixture of (a) 50 to 98 parts by weight of a vinyl chloride polymer having an inherent viscosity of at least 0.4, and (b) 50 to 2 parts by weight of an addition terpolymer containing acrylonitrile, indene and a third monomer selected from methyl methacrylate or at least one monomer of the group α-methylstyrene and vinyl aromatics of the formula:



where each R is independently selected from Cl, H and a C_1 to C_9 alkyl group and x=1 or 2, combined in the polymer structure such that

(1) when the third monomer is methyl methacrylate, the polymer contains in weight percent 2–35 acrylonitrile, 10–67 indene, 5–85 methyl methacrylate, and the moles of acrylonitrile plus methyl methacrylate are equal to or more than the moles of indene,

(2) when the third monomer is one or both of α-methylstyrene and said vinyl aromatics, the polymer contains in weight percent 10–40 acrylonitrile, 5–67 indene and 4–70 of said third monomer, and the moles of acrylonitrile plus said vinyl aromatics is equal to or greater than the moles of α-methylstyrene plus indene.

4,681,917

POLY (VINYL CHLORIDE) COMPOSITIONS

George S. Li, Solon; Muyen M. Wu, Hudson, and Elmer J. Dewitt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1986, Ser. No. 859,518

Int. Cl.[4] C08L 27/06

U.S. Cl. 525—210 6 Claims

1. A composition comprising an intimate admixture of (a) 50 to 98 parts by weight of a vinyl chloride polymer having an inherent viscosity of at least 0.4 and (b) 50 to 2 parts by weight of an addition copolymer containing indene and one comonomer selected from acrylonitrile, methyl methacrylate and

methacrylonitrile, combined in the polymer structure with indene in the amount of 31.5–70 acrylonitrile, or 37–80 methacrylonitrile, or 46–95 methyl methacrylate, all per 100 parts by weight of indene plus comonomer combined in the polymer structure.

4,681,918

"LIVING" POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 549,409, Nov. 7, 1983, Pat. No. 4,508,880, and a continuation-in-part of Ser. No. 389,110, Jun. 17, 1982, Pat. No. 4,417,034, which is a continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned. This application Nov. 21, 1981, Ser. No. 673,926

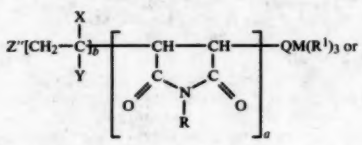
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] **C08F** *265/10, 267/10, 297/00*

U.S. Cl. 525—282 **7 Claims**

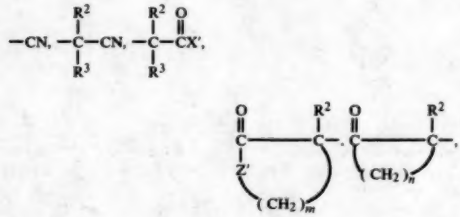
1. Process of preparing a "living" block polymer by contacting under polymerizing conditions:

(1) the "living polymer of the formula



wherein:

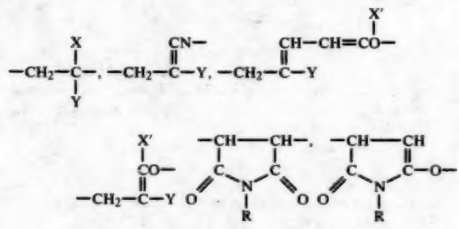
Z″ is selected from the group consisting of



—P(O)(NR′R″)$_2$, —P(O)(OR^1)$_2$, —P(O)[OSi(R^1)$_3$]$_2$ and —SR;

each of a and b is independently selected from 0 or a number in the range 1 to about 100,000, provided, however, (a+b) is at least 3;

Q is the divalent radical selected from the group consisting of



and mixtures thereof;

X is —CN, —CH=CHC(O)X′ or —C(O)X′;

Y is —H, —CH$_3$, —CN or —CO$_2$R, provided, however, when X is —CH=CHC(O)X′, Y is —H or —CH$_3$;

X′ is OSi(R^1)$_3$, —R, —OR or —NR′R″;

each R^1, independently, is hydrocarbyl of up to 20 carbon atoms or H, provided that at least one R^1 group is not H;

R is:

(a) hydrocarbyl of up to 20 carbon atoms;

(b) hydrocarbyl of (a) containing one or more ether oxygen atoms within aliphatic segments thereof; or

(c) hydrocarbyl of (a) or (b) containing one or more functional substituents that are unreactive under polymerizing conditions;

each of R′ and R″ is independently selected from C$_{1-4}$ alkyl;

each of R^2 and R^3 is independently selected from:

(a) H;

(b) hydrocarbyl of up to 20 carbon atoms;

(c) hydrocarbyl of (b) containing one or more ether oxygen atoms within aliphatic segments thereof; or

(d) hydrocarbyl of (b) or (c) containing one or more functional substituents that are unreactive under polymerizing conditions;

Z′ is O or N;

m is 2, 3 or 4;

n is 3, 4 or 5;

M is Si, Sn or Ge,

R$_p$ is of valence p and is:

(a) a hydrocarbyl radical which is aliphatic, alicyclic, aromatic or aliphatic-aromatic containing up to 20 carbon atoms;

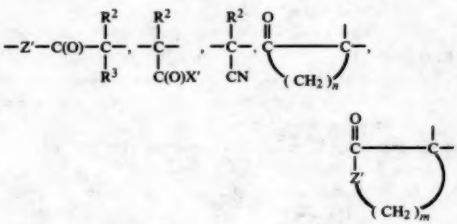
(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical from (a) or (b) containing one or more ether oxygen atoms;

(d) a radical from (a), (b) or (c) containing one or more keto groups; or

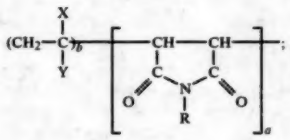
(e) a radical from (a), (b), (c) or (d) containing one or more functional substituents that are unreactive under polymerizing conditions;

Z^3 is a diradical selected from the group consisting



and mixtures thereof;

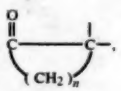
P̄ is a divalent polymeric radical of the formula



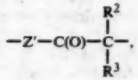
k is 0 or 1; and

p is an integer and is at least 1 when k is 1 or at least 2 when k is 0, provided however,

(i) when Z^3 is



M is Sn or Ge;
(ii) when Z^3 is

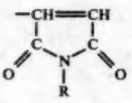


R^2 and R^3 taken together is

and
(iii) when Z^3 is

R^2 and X' taken together is

(2) the monomer selected from the group consisting of $CH_2=C(Y)X$,



and mixtures thereof, wherein X, Y and R are as defined above; and
(3) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid to produce a "living" block polymer containing polymer repeat units of the monomer.

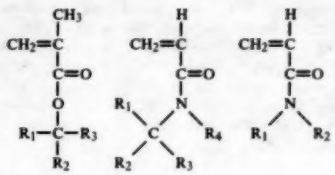
4,681,919

POLYMERIZABLE, OPTICALLY ACTIVE POLYMER AND PROCESS FOR PREPARING POLYMERIZABLE POLYMER

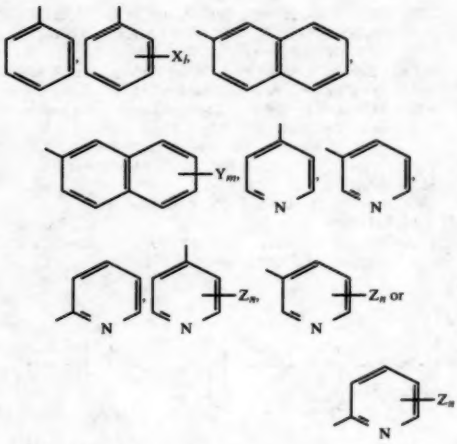
Heimei Yuki, Sakai, and Yoshio Okamoto, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 493,173, May 10, 1983, Pat. No. 4,554,323. This application Sep. 13, 1985, Ser. No. 775,904
Claims priority, application Japan, May 21, 1982, 57-86206
Int. Cl.[4] C08L *291/00, 297/02, 265/04, 265/10*
U.S. Cl. 525—292 **8 Claims**

1. A graft copolymer comprising a backbone comprised of polymerized units of a first vinyl monomer component and optically active polymeric side chains grafted to said backbone, said optically active polymeric side chains having been obtained by polymerizing a monomer selected from the group consisting of compounds having the following formulae:



wherein R_1, R_2 and R_3 may be the same or different and each represent



in which X, Y and Z each represent an alkyl group, a halogen or an amino group, l, m and n each represent the number of the substituents and are each an integer of 1 to 5, and R_4 represents an alkyl group having 1 to 4 carbon atoms.

4,681,920

CHEMICAL MODIFICATION OF POLYDIACETYLENE CRYSTALS

Daniel J. Sandman, Acton, and Boris S. Elman, Allston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 3, 1985, Ser. No. 751,631
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—328.1 **4 Claims**

1. A brominated polydiacetylene material consisting essentially of crystalline brominated poly-1,6-di-(N-carbazolyl)-2,4-hexadiyne having at least two and up to about nine bromine atoms per repeat unit and characterized by a Fourier transform infrared spectrum including absorption at 795 ± 5, 835 ± 5, and 865 ± 5 cm^{-1}.

4,681,921

PROCESS FOR PREPARING IMPROVED HALOGENATED BUTYL RUBBER

Irwin J. Gardner, Scotch Plains; James V. Fusco, Red Bank, both of N.J., and Francis P. Baldwin, Coupeville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 5, 1984, Ser. No. 597,188
Int. Cl.[3] C08F *8/20*
U.S. Cl. 525—357 **10 Claims**

1. A process for treating a halogenated butyl rubber to

isomerize the halogenated rubber thereby shifting a substantial fraction of the halogen from an initial secondary allylic configuration to a primary allylic configuration which comprises contacting a solution of the rubber with a Friedel-Crafts catalyst at a temperature of about 20° C. to about 150° C. for a reaction time sufficient to cause the isomerization wherein the isomerized rubber contains less than 0.25 mole percent conjugated diene and at least 0.6 weight percent halogen.

4,681,922

THERMOPLASTIC POLYSILOXANE-POLYESTER (CARBONATE) BLOCK COPOLYMERS, THEIR PREPARATION AND USE

Manfred Schmidt; Winfried Paul; Dieter Freitag, all of Krefeld, and Dietrich Rathmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

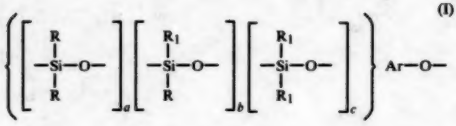
Filed Nov. 29, 1984, Ser. No. 676,483

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344911

Int. Cl.⁴ C08G *77/40, 63/24, 63/46*

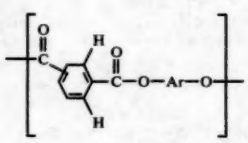
U.S. Cl. 525—474 **7 Claims**

1. A siloxane-polyester(carbonate) block copolymer with repeat structural units of the formulae



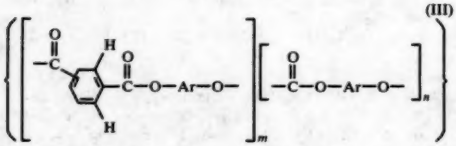
(I)

and



(II)

or



(III)

wherein

R and R_1 each denote optionally halogen-substituted C_1–C_{20}-alkyl, C_2–C_6-alkenyl, C_6–C_{14}-aryl, C_7–C_{15}-aralkyl or C_7–C_{15}-alkaryl,

a, b and c together denote a number from 10 to 100 and

Ar denotes a mononuclear or polynuclear aromatic radical having 6 to 30 C atoms,

and the ratio m/n is 1:9 to 9:1, characterized in that the structure units I represent 0.5 to 7.5% by weight and the structural units II or III represent 99.5 to 92.5% by weight of the siloxane-polyester-(carbonate) block copolymer (disregarding the terminating groups), and the ratio of the isophthalic acid units to the terephthalic acid units in the structural units II and III is 3:7 to 7:3.

4,681,923

MODIFIED QUINONE-DIAZIDE GROUP-CONTAINING PHENOLIC NOVOLAK RESINS

Christopher G. Demmer, Cambridge, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

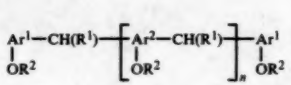
Filed Feb. 21, 1986, Ser. No. 831,685

Claims priority, application United Kingdom, Mar. 2, 1985, 8505402

Int. Cl.⁴ C08G *8/32;* **C08L** *61/14*

U.S. Cl. 525—504 **20 Claims**

1. An electrodepositable photosensitive modified phenolic novolak resin of general formula



I

where

Ar^1 represents a divalent aromatic group linked through aromatic carbon atoms to the indicated groups —OR^2 and —$CH(R^1)$—,

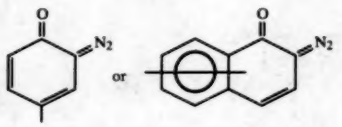
Ar^2 represents a trivalent aromatic group linked through aromatic carbon atoms to the indicated groups —OR^2 and —$CH(R^1)$—,

R^1 represents a hydrogen atom or an alkyl, aryl or carboxyl group,

R^2 represents a hydrogen atom, an alkyl group, an alkyl group substituted by a hydroxyl or alkoxy group, or a group of formula —CO—R^3—COOH, —SO_2R^4, —COR^5 or —SO_2R^5, at least 1% of the groups R^2 representing a group —CO—R^3—COOH and at least 4% of the groups R^2 representing a group —SO_2R^4,

R^3 denotes a divalent aliphatic, cycloaliphatic, aromatic or araliphatic group,

R^4 denotes a 1,2-benzoquinone diazide group or 1,2-naphthoquinone diazide group of formula



II III

the free valency bond of formula III being in the 4- or 5 -position,

R^5 represents a carboxyl-free monovalent aliphatic, cycloaliphatic, aromatic or araliphatic group, and

n denotes zero or an integer of 1 to 20.

4,681,924

CATALYST SYSTEMS FOR POLYMERIZATIONS AT HIGH TEMPERATURES

James J. Harris; Donald E. Hostetler, and G. Stanley Achorn, all of West Chester, Pa., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,224

Int. Cl.⁴ C08F *4/64, 210/02*

U.S. Cl: 526—125 **13 Claims**

1. A method of preparing low density polyethylene having a density of between 0.91 and 0.93 grams per cubic centimeter comprising copolymerizing ethylene with from 1 to 50 percent by weight of an alpha-monoolefin comonomer having 3 to 20 carbon atoms, said copolymerization being carried out at a temperature between 200° C. and 300° C. at pressure up to 50,000 psig in the presence of

(a) a catalyst prepared by

(i) co-comminuting a mixture of an anhydrous magnesium

halide, anhydrous aluminum halide and a first electron donor, and

(ii) co-comminuting the mixture from (1) with a complex of a titanium compound and a second electron donor, which may be different from or the same as said first electron donor; said co-comminuting being carried out under an inert atmosphere in the presence of an inert solvent, and

(b) a co-catalyst comprising a synergistic mixture of between 40 to 80 mole percent of an alkyl aluminum chloride and 20 to 60 mole percent of an oxygen-containing aluminum compound selected from the group consisting of aluminum oxide, dialkyl aluminum alkoxide, alkyl aluminum dialkoxide, aluminum trialkoxide, tetraalkyldialuminoxane, pentaalkyltrialuminoxane, and hexaalkyltetraaluminoxane, wherein alkyl may be linear or branched alkyl groups having 1 to 10 carbon atoms in the group.

4,681,925

FLUORINATED POLYACRYLATES AND POLYACRYLAMIDES HAVING A CONTROLLED CROSS-LINKING DEGREE, AND PROCESS FOR PREPARING SAME

Ezio Strepparola, Treviglio, and Alberto Re, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Feb. 21, 1986, Ser. No. 831,617

Claims priority, application Italy, Feb. 22, 1985, 19629 A/85

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—246 **4 Claims**

1. Acrylic or methacrylic polymers, having a controlled cross-linking degree, prepared by radicalic polymerization of a monomer mixture comprising:

(a) from 1% to 99% by moles of a monomer of the monoacrylate or monoacrylamide type, consisting of a perfluoropolyoxyalkylene chain and having one of the following general formulas:

(a.1)

$$A-O(C_3F_6)_m(CF_2O)_n\left(\begin{array}{c}CFO\\|\\CF_3\end{array}\right)_q-CF_2-Z-CO-CR=CH_2$$

wherein:

m, n and q are integers from 0 to 50, and m+n+q is not lower than 2, the oxyfluoroalkylene unites being statistically distributed along the chain;

A is a perfluoroalkyl end groups of the type

CF_3-, $CF_3-O-CF(CF_3)-$, C_3F_7-;

Z is $-CX(Y)O-(CH_2-CH_2O)_p-$ or $-CH_2NR'-$;

X is a hydrogen atom or a fluorine atom;

Y is CF_3 or it may be also H if also X is H;

R and R', like or different from each other, may be H or CH_3;

p=0–3;

$$C_3F_7O(C_3F_6O)_r\,CF_2-Z-CO-CR=CH_2 \qquad (a.2)$$

wherein Z and R have the above defined meanings and r is an integer of at least 2;

$$F(CH_2CF_2CF_2O)_sCH_2CF_2-Z-CO-CR=CH_2 \qquad (a.3)$$

wherein s is an integer comprised between 1 and 50 and Z and R have the meanings above defined;

(b) from 99% to 1% by moles of a monomer of the diacrylate or diacrylamide type, consisting of a perfluoropolyoxyalkylene chain and having one of the following formulas:

$$CH_2=CR-CO-Z-CF_2O(C_2F_4O)_m-(CF_2O)_n-CF_2-Z-CO-CR=CH_2 \qquad (b.1)$$

in which the units $-C_2F_4O-$ and $-CF_2O-$ are statistically distributed along the chain, Z and R being the same as defined hereinbefore, and m and n being integers from 1 to 50;

$$CH_2=CR-CO-Z-CF_2O(C_3F_6O)_r(C_2F_4O)_s(CFXO)_tC-F_2-Z-CO-CR=CF_2 \qquad (b.2)$$

wherein r, s and t are integers from 1 to 50 and Z and R have the meanings as above defined:

$$CH_2=CR-CO-Z-CF_2CH_2(OCF_2CF_2CH_2)_v-OR'_f-O-(CH_2CF_2CF_2O)_vCH_2C-F_2-Z-CO-CR=CH_2 \qquad (b.3)$$

wherein s and v are integers from 1 to 50 and Z and R have the meanings as above defined, R'_f being a perfluoroalkylene radical of 1–6 carbon atoms.

4,681,926

RAPID SETTING POLYMERS FROM BICYCLIC AMIDE ACETALS/POLYOLS/POLYISOCYANATES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 11, 1986, Ser. No. 850,657

Int. Cl.[4] C08G *18/08, 18/16*

U.S. Cl. 528—48 **12 Claims**

1. The process for preparing a rapid setting, bubble free rigid polyurethane of improved properties comprising reacting a bicyclic amide acetal conforming to the formula

Wherein R, R' and R''' independently represent hydrogen or an alkyl group having from 1 to 18 carbon atoms, and R''' also represents an alkyl ether group having from 1 to 18 carbon atoms, an aryl ether or alkaryl ether group having from 6 to 20 carbon atoms, R'' represents an alkyl grup having from 1 to 18 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an alkaryl group having from 7 to 20 carbon atoms, a poly isocyanate and a polyol in the presence of a plasticizer selected from the group consisting of carboxylic acid esters, organic phosphites, organic phosphates, alkylene carbonates, lactones, fatty oils, cyclic polyethers, aromatic compounds free from ester groups, partially hydrogenated aromatic compounds free from ester groups, and halogenated aliphatic compounds boiling above a temperature in the range of from about room temperature to about 200° C.

4,681,927

PROCESS FOR PRODUCING OXYMETHYLENE COPOLYER

Toshikazu Umemura, Takarazuka; Isamu Masumoto, and Yukihiro Iha, both of Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 27, 1986, Ser. No. 866,959

Claims priority, application Japan, May 29, 1985, 60-116290

Int. Cl.[4] C08G *2/10, 2/16*

U.S. Cl. 528—232 **10 Claims**

1. A process for producing an oxymethylene copolymer by copolymerizing trioxane with at least one cyclic comonomer selected from the group consisting of cyclic ethers and cyclic formals, said process comprising

(1) polymerizing trioxane alone or with a cyclic comonomer in the presence of a polymerization catalyst until the conversion of trioxane reaches 10 to 95%, and

(2) thereafter adding a cyclic comonomer and a polymeriza-

tion catalyst to the reaction system and continuing the polymerization.

4,681,928

POLY(AMIDE-AMIDE ACID), POLYAMIDE ACID, POLY(ESTERAMIDE ACID), POLY(AMIDE-IMIDE), POLYIMIDE, POLY(ESTERIMIDE) FROM POLY ARYLENE DIAMINE

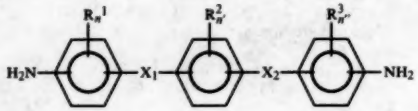
Abe Berger, Summit, and Rohitkumar H. Vora, Rahway, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jun. 1, 1984, Ser. No. 616,329

Int. Cl.[4] C08G *73/10*

U.S. Cl. 528—353 **11 Claims**

1. A thermoplastic polyimide, poly(amide-imide), poly(esterimide) polyamide acid, poly(amide-amide acid) or poly(esteramide acid) composition which contains at least about 10 mole percent of the reaction product of an aromatic or aliphatic tetracarboxylic dianhydride or acid tricarboxylic acid anhydride and an aromatic diamine having the formula



wherein

R^1, R^2 and R^3 each independently is hydrogen, halogen or unsubstituted or substituted hydrocarbyl,

X_1 and X_2 each independently is substituted or unsubstituted branched, linear or cyclic alkylene or alkenylene of 1 to about 30 carbon atoms, —S—, or —O— with the proviso that X_1 and X_2 are not both concurrently —S— or —O—.

n, n' and n'' each independently is an integer of 1 to 4.

4,681,929

USE OF RUBBER SOLVENT-RESIN SOLVENT AND MISCELLA MIXTURES FOR EXTRACTION-EXPRESSION OF RUBBER AND RESINS FROM GUAYULE SHRUB

William M. Cole, Norton; Steven L. Fenske, Uniontown, both of Ohio; David J. Serbin, Springfield, Va.; Shrikant R. Malani, Akron, Ohio; Frank J. Clark, Massillon, Ohio, and Joanne L. Beattie, Uniontown, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 29, 1985, Ser. No. 728,366

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] C08C *1/04*

U.S. Cl. 528—493 **9 Claims**

1. A process for extracting resin and rubber from guayule plants, comprising the steps of:

adding a portion of a recycled miscella monophase solvent system to prepared guayule plants containing resin and rubber therein, said miscella monophase solvent system containing from about 50% to about 95% by weight of a hydrocarbon solvent and from about 5% to about 50% by weight of a polar solvent, wherein said hydrocarbon solvent is selected from the group consisting of an alkane having from 4 to 9 carbon atoms, a cycloalkane having from 5 to 10 carbon atoms, an aromatic or an alkyl substituted aromatic having from 6 to 12 carbon atoms, and combinations thereof, wherein said polar solvent is selected from the group consisting of an alcohol having from 1 to 8 carbon atoms, an ester having from 3 to 8 carbon atoms, a ketone having from 2 to 8 carbon atoms, an ether having from 2 to 8 carbon atoms, and combinations thereof, and wherein the amount of recycled miscella is at least 70% by weight,

simultaneously and continuously extracting resin and rubber from said guayuale plants, and

conducting at least one expression on said guayule plants.

4,681,930

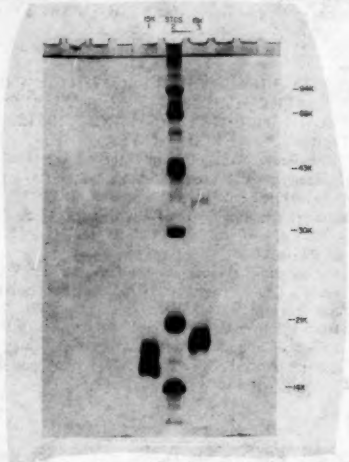
IMMUNE INTERFERON AND A METHOD FOR ITS EXTRACTION AND PURIFICATION

Hsiang-Fu Kung, Verona, N.J.; Hiromu Sugino, Kamigoryonaka, and Susumu Honda, Okaka, both of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J. and Takeda Chemical Industries Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 534,040, Sep. 20, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 639,551

Int. Cl.[4] C07K *15/26*; A61K *45/02*; C12P *21/00*

U.S. Cl. 530—351 **9 Claims**



1. A method for the purification of intact recombinant human immune interferon protein from transformed microorganisms containing this protein comprising extracting the intact recombinant human immune interferon from said transformed microorganisms with a protease inhibitor compound and purifying the resulting intact recombinant human immune interferon from the extraction preparation with the use of monoclonal antibodies specific for the carboxyl terminus of said interferon.

4,681,931

PROCESS FOR THE ISOLATION AND PURIFICATION OF ALPHA-INTERFERONS

Rainer Obermeier, Hattersheim am Main; Ingeborg Salomon, Wöllstadt, and Jürgen Ludwig, Brachttal, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 6, 1985, Ser. No. 741,865

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421302

Int. Cl.[4] C07K *15/26*; A61K *45/02*; C12P *21/00*

U.S. Cl. 530—351 **10 Claims**

1. A process for the isolation and purification of α-interferons generated by plasmids from bacterial cultures which have been modified by genetic engineering, and of α-interferons from culture supernatants from induced mammalian cells, which comprises partition of crude materials containing α-interferon between an aqueous urea solution, which contains an anionic surfactant, and a mixture of n-butanol and glacial acetic acid which contains water, and isolation of the purified α-interferons from the upper phase.

4,681,932
BENZOISOTHIAZOLE AZO DYESTUFFS

Winfried Kruckenberg; Klaus Leverenz, and Hans-Günter Otten, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

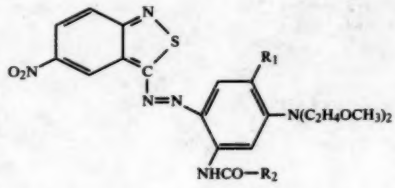
Filed Jun. 27, 1985, Ser. No. 750,559

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425127

Int. Cl.[4] C09B *29/045, 29/09, 67/48;* **D06P** *1/18, 3/54*

U.S. Cl. 534—575 **3 Claims**

1. An azo dyestuff of the formula



wherein

R_1 denotes hydrogen and

R_2 denotes hydrogen or C_1–C_2-alkyl.

4,681,933
2',3'-DIDEOXY-5-SUBSTITUTED URIDINES AND RELATED COMPOUNDS AS ANTIVIRAL AGENTS

Chung K. Chu, Athens, and Raymond F. Schinazi, Tucker, both of Ga., assignors to University of Georgia Research Foundation, Inc., Athens and Emory University, Atlanta, both of, Ga.

Filed May 1, 1986, Ser. No. 857,947

Int. Cl.[4] C07H *19/073*

U.S. Cl. 536—23 **6 Claims**

1. The compound which is 3'-azido-2',3'-dideoxy-5-ethyluridine.

4,681,934
CROSSLINKING AGENT AND PROCESS FOR THE PREPARATION OF THE SAME

Ichiro Shibanai, 10-6-312, Akasaka 6-chome, Minato-ku, Tokyo 107; Koki Horikoshi, 39-8, Sakuradai 4-chome, Nerima-ku, Tokyo 176, and Takashi Kato, 1170-14, Narahashi, Higashiyamato-shi, Tokyo 189, all of Japan

PCT No. PCT/JP85/00015, § 371 Date Aug. 22, 1985, § 102(e) Date Aug. 22, 1985, PCT Pub. No. WO85/03303, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 18, 1985, Ser. No. 772,299

Claims priority, application Japan, Jan. 20, 1984, 59-7267

Int. Cl.[4] C08B *37/16*

U.S. Cl. 536—46 **6 Claims**

1. A crosslinking agent comprising a cyclodextrin clathrate compound comprising cyclodextrin having included therein a compound having isocyanate groups.

4,681,935
PROCEDURE FOR RECOVERING SOLUBLE CARBOHYDRATES CONTAINED IN WOOD

Kaj Forss, Helsinki; Matti Sten, Salosaari; Juhani Peltonen, Imatra, and Veikko Jokela, Tiurinniemi, all of Finland, assignors to Enso-Gutzeit Oy, Helsinki, Finland

PCT No. PCT/FI85/00035, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04409, PCT Pub. Date Oct. 10, 1985

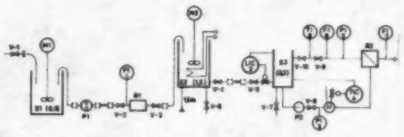
PCT Filed Apr. 2, 1985, Ser. No. 817,838

Claims priority, application Finland, Apr. 2, 1984, 841318

Int. Cl.[4] C08B *37/14;* **D21C** *3/02*

U.S. Cl. 536—56 **7 Claims**

1. In a procedure for recovery of soluble carbohydrates present in wood wherein the carbohydrates to be recovered which are contained in wood to be digested to cellulose are brought into a solution from which they are separated, and wherein the treatment of the wood thereafter continues as an alkaline cellulose digestion process, the improvement which comprises performing the recovery of the carbohydrates at the initial phase of the cellulose digesting process, where the poly-



saccharide content of the digesting solution is high and the content of polymeric lignin is low, by conducting the digesting solution into an ultrafilter which separates the carbohydrates therefrom, and returning the filtered solution to the cellulose digestion and wherein the separation of carbohydrates is carried out before the digesting solution has reached that temperature at which the digesting process mainly takes place.

4,681,936
PREPARATION OF SUGAR KETALS

Klaus-Peter Pfaff, Mannheim; Joachim Paust, Neuhofen, and Horst Hartmann, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,317

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505150

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—124 **14 Claims**

2. A process for the preparation of diacetone-L-sorbose by reacting L-sorbose with acetone in the presence of an acid catalyst, wherein

A. boron trifluoride diethyl etherate or trifluoromethanesulfonic acid is used in an amount of from 0.01 to 10% by weight, based on the sugar used,

B. more than 10 to about a 30-fold molar excess of the ketone is used and

C. the water formed during the reaction is removed continuously from the reaction mixture.

4,681,937
3-ACYLAMINO-2-OXO-1-AZETIDINYL ESTERS OF PHOSPHONIC ACIDS, PHOSPHORIC ACID AND PHOSPHORIC ACID ESTERS

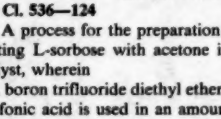
William A. Slusarchyk, Belle Mead; Tamara Dejneka, Skillman; William H. Koster, East Amwell Township, Hunterdon County, and Eric M. Gordon, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,132

Int. Cl.[4] C07F *9/65;* **A61K** *31/675*

U.S. Cl. 540—355 **22 Claims**

1. A β-lactam having the formula



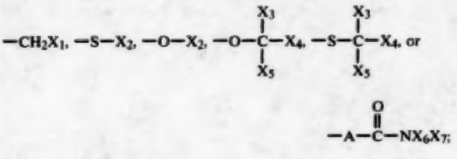
or a pharmaceutically acceptable salt thereof, wherein

R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted

phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl,



X_1 is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano, $-S-X_2$ or $-O-X_2$;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

A is $-CH=CH-$, $-CH_2-CH=CH-$, $-(CH_2)_n-$, $-(CH_2)_{n'}-O-$, $-(CH_2)_{n'}-NH-$, or $-(CH_2)_{n'}-S-CH_2$;

n is 0, 1, 2 or 3;

n' is 1 or 2;

X_6 and X_7 are the same or different and each is hydrogen or alkyl, or X_6 is hydrogen and X_7 is amino, substituted amino, acylamino or alkoxy;

R_5 is hydroxyl, alkyl, substituted alkyl, phenyl, substituted phenyl, alkoxy, alkylthio, (substituted alkyl)oxy, (substituted alkyl)thio, phenyloxy, phenylthio, (substituted phenyl)oxy or (substituted phenyl)thio; and

Y is oxygen or sulfur;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

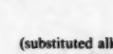
the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (4, 5, 6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

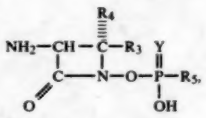
the term "a 4, 5, 6, or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "substituted amino" refers to a group having the formula $-NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;

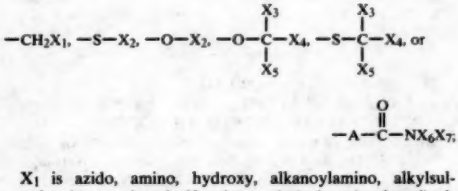
the term "substituted alkanoyl" refers to a group having the formula



2. A β-lactam having the formula



or a salt thereof, wherein R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle, or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl,



X_1 is azido, amino, hydroxy, alkanoylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano, $-S-X_2$ or $-O-X_2$;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, substituted alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

A is $-CH=CH-$, $-CH_2-CH=CH-$, $-(CH_2)_n-$, $-(CH_2)_{n'}-O-$, $-(CH_2)_{n'}-NH-$, or $-(CH_2)_{n'}-S-CH;$

n is 0, 1, 2 or 3;

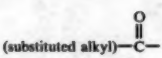
n' is 1 or 2;

X_6 and X_7 are the same or different and each is hydrogen or alkyl, or X_6 is hydrogen and X_7 is amino substituted amino, acylamino or alkoxy;

R_5 is hydroxyl, alkyl, substituted alkyl, phenyl, substituted phenyl, alkoxy, alkylthio, (substituted alkyl)oxy, (substituted alkyl)thio, phenyloxy, phenylthio, (substituted phenyl)oxy or (substituted phenyl)thio;

Y is oxygen or sulfur;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;
the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;
the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;
the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;
the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (4, 5, 6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;
the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;
the term "a 4, 5, 6, or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furylimino, benzylimino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;
the term "substituted amino" refers to a group having the formula $-NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino;
the term "substituted alkanoyl" refers to a group having the formula



4,681,938

NOVEL POLYCYCLIC HYDRAZONES OF RIFAMYCINS, THEIR MANUFACTURE, AND THEIR PHARMACEUTICAL COMPOSITIONS FOR TREATING TUBERCULOSIS

Peter Traxler, Schönenbuch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 644,886, Aug. 27, 1984, Pat. No. 4,551,450. This application Aug. 8, 1985, Ser. No. 763,725
The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.
Int. Cl.[4] C07D *519/00*; A61K *31/495, 31/395*
U.S. Cl. 540—458 **9 Claims**

1. The hydrazons of 3-foreylrifamycin SV with 3-amino-7-ethylperhydro-1H-pyrido-[1,2-a]pyrazine and a pharmaceutically acceptable alkali metal salt thereof in the form of an individual isomer or a mixture comprising more than one such isomer.

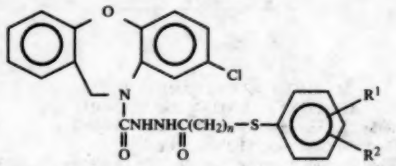
4,681,939

8-CHLORODIBENZ[B,F][1,4]OXAZEPINE-10-(11H)-CARBOXYLIC ACID, 2-[(PHENYLTHIO)ALKANOYL]HYDRAZIDES

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 770,457, Aug. 29, 1985. This application Nov. 14, 1986, Ser. No. 931,369
Int. Cl.[4] C07D *267/20*
U.S. Cl. 540—547 **2 Claims**

1. A compound of the formula:



wherein
R1 is:
(a) hydrogen;
(b) alkyl of 1 to 4 carbon atoms, inclusive;
(c) alkoxy of 1 to 4 carbon atoms inclusive or
(d) halogen;
wherein
R^2 is:
(a) hydrogen;
(b) alkyl of 1 to 4 carbon atoms, inclusive;
(c) alkoxy of 1 to 4 carbon atoms, inclusive; or
(d) halogen; and
wherein
n is an integer from 1 to 4 inclusive.

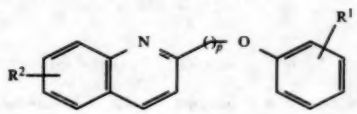
4,681,940

5-[3-[[2-QUINOLYL]METHOXY]PHENYL]-1,3-OXAZOLES

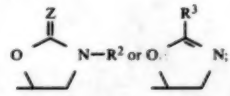
John H. Musser, Malvern, and Reinhold H. W. Bender, Valley Forge, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,673
Int. Cl.[4] C07D *417/12, 413/12, 413/14*
U.S. Cl. 546—174 **7 Claims**

1. A compound having the formula



wherein
R^1 is



R^2 is hydrogen or lower alkyl;
R^3 is hydrogen, lower alkyl, phenyl, thienyl, furyl, pyridyl, CF_3, $-(CH_2)_pCOOR^2$ or

P is 0–3
Z is O or S;
and the pharmaceutically acceptable salts thereof.

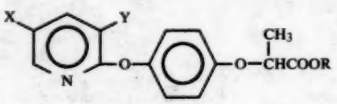
4,681,941

METHOD OF PREPARING ESTERS OF ARYLOXYPHENOXY PROPANOIC ACID

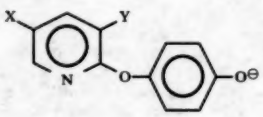
Timothy J. Adaway, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 494,196, May 13, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 721,987
Int. Cl.⁴ C07D *213/55, 213/64*
U.S. Cl. 546—302 **16 Claims**

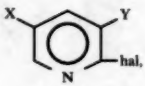
1. In a method of preparing an ester of an aryloxyphenoxy propanoic acid of the formula



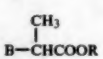
wherein
X represents H, CF_3, Cl, F, Br or I;
Y represents Cl, H, F, Br, CF_3 or I and
R represents C_1–C_8 alkyl or C_3–C_6 alkoxyalkyl;
which comprises forming



by the reaction of



wherein X and Y are as defined above and hal is Cl, F, Br, or I,
with the dianion of hydroquinone under an inert atmosphere while maintaining the water content of the reaction mixture at less than 1,000 ppm and thereafter, without isolation of the phenate intermediate, reacting with an excess stoichiometric amount of a propionate of the formula



wherein
R is as defined above; and
B represents Cl or Br
at a temperature that does not exceed 35° C.

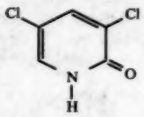
4,681,942

PROCESS FOR THE PRODUCTION OF 3,5-DICHLORO-2-PYRIDONE

Daniel Quarroz, Canton Valais, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jun. 19, 1986, Ser. No. 875,927
Claims priority, application Switzerland, Jun. 25, 1985, 2691/85
Int. Cl.⁴ C07D *211/72*
U.S. Cl. 546—303 **9 Claims**

1. Process for the production of 3,5-dichloro2-pyridone having the formula:



comprising reacting 6-hydroxynicotinic acid with chlorine or a chlorine-releasing agent.

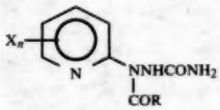
4,681,943

1-ACYL-1-(2-PYRIDINYL)SEMICARBAZIDES

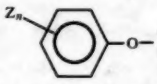
Charles E. Whitten, Plymouth, Mass., and R. Garth Pews, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 676,892, Nov. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,743, Feb. 11, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 840,359
Int. Cl.⁴ C07D *213/75*
U.S. Cl. 546—306 **2 Claims**

1. A compound of the formula



wherein
R represents C_1–C_4 alkyl;
each X independently represents Cl, F, Br, NO_2, C_1–C_4 alkyl, NH_2, mono- or dialkylamino wherein each alkyl contains from 1 to 4 carbon atoms, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, CN, CF_3, CCl_3, phenoxy or substituted phenoxy of the formula



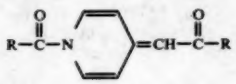
wherein
each Z independently represents Cl, F, Br, NO_2, CN, C_1–C_4 alkoxy, C_1–C_4 alkylthio, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; and
each n independently represents an integer of from 0 to 3, inclusive.

4,681,944
PROCESS FOR PREPARING CERTAIN 1-LOWER ALKANOYL OR BENZOYL-4-(LOWER ALKANOYL OR BENZOYL-METHYLIDENE)-1,4-DIHYDROPYRIDINES OR ACID ADDITION SALTS THEREOF

Robert M. Ippolito, 7471 Yonge St., Apt. 707, Thornhill, Ontario, Canada (L3T 2C1), and Stephen Vigmond, 291 Avenue Rd., #701, Toronto, Ontario, Canada (M4V 2G9)

Filed Jun. 11, 1985, Ser. No. 743,499
Int. Cl.[4] C07D *211/82*
U.S. Cl. 546—340 **7 Claims**

1. A process for preparing a compound of formula II



or acid addition salts thereof wherein R represents C_1–C_5 alkyl or phenyl which comprises reacting an acylating agent selected from an acyl halide of formula R-CO-X, an anhydride of formula R-CO-O-CO-R and mixtures thereof wherein R is as defined above and X is halogen, with 4-methylpyridine, in solution in a suitable solvent under substantially anhydrous conditions, and using a molar ratio of acylating agent to 4-methylpyridine of from about 5:1 to 1:1 , with or without a strong anhydrous acid catalyst.

4,681,945
PREPARATION OF SYMMETRICAL TETRACHLOROPYRIDINE FROM CHLORINATED β-(TRICHLOROMETHYL) PYRIDINES EMPLOYING A CATALYST

Paula L. Humphreys, San Ramon, and Thomas J. Dietsche, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 431,515, Sep. 30, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,109
Int. Cl.[4] C07D *213/26*
U.S. Cl. 546—345 **1 Claim**

1. A catalytic process of chlorinating a mixture rich in 2,6-dichloro-3-trichloromethyl pyridine to form a mixture rich in 2,5,6-trichloromethyl pyridine and 2,3,5,6-tetrachloro pyridine comprising:

(a) establishing in a reactor means a reactor charge comprising a mixture rich in 2,6-dichloro-3-trichloro-methyl pyridine and a sufficient amount of ferric chloride catalyst; and

(b) while maintaining the reactor charge in liquid phase at a temperature of at least about 160° C., feeding chlorine into and agitating the reactor charge for a sufficient time to catalytically convert the mixture rich in 2,6-dichloro-3-trichloromethyl pyridine to a mixture rich in 2,5,6-trichloro-3-trichloromethyl pyridine and 2,3,5,6-tetrachloro pyridine.

4,681,946
PREPARATION OF NICOTINAMIDE

Karl G. Baur, Ludwigshafen; Volker Diehl, Ellerstadt; Peter Stops, Altrip; Hans Hellbach, Lampertheim, and Erwin Brunner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 555,402, Nov. 28, 1983, abandoned. This application Nov. 14, 1985, Ser. No. 797,990
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244522
Int. Cl.[4] C07B *43/06*; C07D *213/82*
U.S. Cl. 546—317 **7 Claims**

1. In a process for the preparation of nicotinamide by amidation of nicotinic acid, the improvement which comprises:

reacting a solution of nicotinic acid in nicotinamide, with a nicotinic acid content of 50 to 80% by weight based on the solution, in a first stage with an excess of ammonia at from 190° to 240° C., while removing the water of reaction at the same time by distillation;

subjecting the resulting solution, which is a crude mixture of nicotinic acid and predominantly nicotinamide, in a second stage to fractional distillation in a column under vacuum, removing a pure nicotinamide at the bottom of the column and removing a mixture of nicotinic acid and nicotinamide with a lower nicotinamide content than the feed at the top of the column; and

recycling said nicotinic acid/nicotinamide mixture obtained in the second stage to the first stage while replenishing the recycled mixture with fresh nicotinic acid.

4,681,947
PREPARATION OF OPTICALLY-ACTIVE CYANOMETHYL ESTERS

Donald W. Stoutamire, 904 Bel Passi Dr., and Charles H. Tieman, 2209 Fremont St., both of Modesto, Calif. 95350

Division of Ser. No. 551,652, Nov. 14, 1983, Pat. No. 4,560,515, which is a continuation-in-part of Ser. No. 443,513, Nov. 22, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,472
Int. Cl.[4] B01J *31/00*
U.S. Cl. 544—370 **2 Claims**

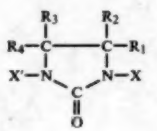
1. A catalyst which comprises a cyclo(D-phenylalanyl-D-histidine) dipeptide.

4,681,948
N,N'DIHALO-2-IMIDAZOLIDINONES

Shelby D. Worley, Auburn, Ala., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1986, Ser. No. 846,767
Int. Cl.[4] C07D *233/32*
U.S. Cl. 548—319 **15 Claims**

1. N,N'-dihalo-2-imidazolidinone represented by the graphic formula:



wherein X and X' are each halogen selected from the group chlorine and bromine, R_1, R_2, R_3, R_4 are each selected from the group consisting of hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, and substituted phenyl, said phenyl substituents being each selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, and hydroxy, provided that not more than one of the substituents R_1–R_4 is hydrogen, provided further that when both X and X' are chlorine, not more than three of the substituents R_1–R_4 are methyl.

4,681,949
BIS-AMINOPYRIDINIUM SALTS AS PHASE TRANSFER CATALYSTS FOR AROMATIC ETHER IMIDE PREPARATION

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

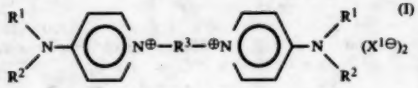
Division of Ser. No. 553,713, Nov. 21, 1983, Pat. No. 4,595,760. This application Apr. 30, 1986, Ser. No. 857,657
Int. Cl.[4] C07D *209/48, 403/10, 403/12*
U.S. Cl. 548—461 **8 Claims**

1. In a method for preparing an aromatic ether by the reaction, in a non-polar organic solvent in the presence of a phase transfer catalyst, of (A) at least one hydroxyaromatic compound alkali metal salt having the formula

$R^1(OM)_a$, II

wherein R^1 is an aromatic radical containing about 6–30 carbon atoms, M is an alkali metal and a is 1 or 2, with (B) at least one activated halo- or nitro-substituted aromatic compound;

the improvement which comprises using as said phase transfer catalyst at least one bis-aminopyridinium salt having the formula



(I)

wherein:

each of R^1 and R^2 is independently an aliphatic hydrocarbon-based radical containing about 1–13 carbon atoms, or R^1 and R^2 together form a divalent aliphatic hydrocarbon-based radical containing about 4–13 carbon atoms; and

R^3 is a divalent hydrocarbon-based radical containing about 4–25 atoms in a single chain connecting the quaternary nitrogen atoms; and

X^1 is an anion-forming atom or radical.

4,681,950

THIOXANTHONE DERIVATIVES

Walter Fischer, Reinach, Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany, and Hans Zweifel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

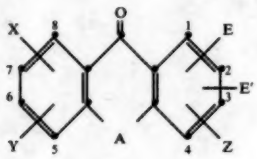
Division of Ser. No. 551,768, Nov. 14, 1983, Pat. No. 4,585,876. This application Dec. 23, 1985, Ser. No. 812,554

Claims priority, application Switzerland, Nov. 25, 1982, 6872/82

Int. Cl.⁴ C07D *335/14, 311/86*

U.S. Cl. 549—27 **8 Claims**

1. A compound of the formula I



(I)

in which A is —S—, X and Y independently of one another are hydrogen, C_{1-20}-alkyl, halogen, —OR′, —SR′ or $—NO_2$, Z is hydrogen, C_{1-4}-alkyl, halogen, —OR′, —SR′, $—NO_2$, $—NH_2$, —OH or $—NHCOCH_3$, E and E′ independently of one another are —COOR″, or $—CON(R'')_2$, R′ is C_{1-20}-alkyl, phenyl, halogenophenyl, nitrophenyl, alkyl- or alkoxy-phenyl having in each case 1–4 C atoms in the alkyl or alkoxy moiety, benzyl or phenethyl, the radicals R″ independently of one another are hydrogen, M^+, C_{1-20}-alkyl, alkoxyalkoxyalkyl having 3–10 C atoms or hydroxyalkyl having 2–8 C atoms, n is the number 1, 2 or 3, and M^+ is an alkali metal cation.

4,681,951

BICYCLO(3.3.0)OCTENE DERIVATIVES

Masakatsu Shibasaki; Toshiaki Mase, both of Tokyo; Mikiko Sodeoka, and Yuji Ogawa, both of Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

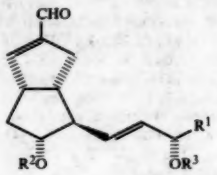
Filed Aug. 17, 1984, Ser. No. 641,587

Claims priority, application Japan, Dec. 27, 1983, 58-244695; Feb. 10, 1984, 59-22010; Mar. 28, 1984, 59-58458

Int. Cl.⁴ C07D *309/10;* **C07C** *47/40*

U.S. Cl. 549—214 **1 Claim**

1. A bicyclo[3.3.0]octene derivative represented by the formula:



wherein

R^1 is a straight, branched or cyclic alkyl group or alkenyl group each having 5 to 10 carbon atoms; and

R^2 and R^3 are each separately a hydrogen atom or a protective group of a hydroxy group.

4,681,952

INTERMEDIATES IN THE PREPARATION OF 2,2-DIMETHYL-3-ARYL-CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

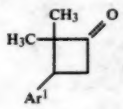
Reinhard Lantzsch, Leverkusen; Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 496,719, May 20, 1983, abandoned. This application Nov. 7, 1984, Ser. No. 669,182

Int. Cl.⁴ C07D *333/38, 333/37, 333/16, 307/02*

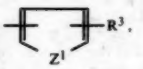
U.S. Cl. 549—61 **1 Claim**

1. A process for the preparation of a 2,2-dimethyl-3-arylcyclobutanone of the formula



in which

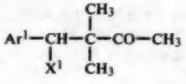
Ar^1 is naphthyl or the radical



Z^1 is oxygen, sulphur or 1,2-ethenediyl, and

R^3 is halogen, cyano, nitro or trialkylsilyl or a radical, which is optionally substituted by halogen, from the series comprising alkyl, cycloalkyl, alkenyl, alkoxy, alkylenedioxy, alkylthio, alkylsulphinyl, alkylsulphonyl, dialkylamino, phenyl and phenoxy,

comprising reacting a 1-aryl-1-halogeno-2,2-dimethyl-3-butanone of the formula



in which

X^1 is chlorine or bromine, with about 1 to 1.2 times the molar amount of a base in the presence of a diluent at a temperature between about −20° and +150° C.

4,681,953
PROCESS FOR PREPARING DIHALOVINYLCYCLOPROPANECARBOXYLATES

Kiyoshi Kondo; Kiyohide Matsui; Akira Negishi, all of Kanagawa, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Aug. 22, 1975, Ser. No. 606,807

Claims priority, application Japan, Sep. 10, 1974, 49-103521; Sep. 26, 1974, 49-109975; Sep. 26, 1974, 49-109976; Nov. 30, 1974, 49-136631; Nov. 30, 1974, 49-136632; Dec. 2, 1974, 49-137026; Dec. 3, 1974, 49-137752; Jan. 16, 1975, 50-6429; Jan. 22, 1975, 50-8673; Jan. 31, 1975, 50-12389; Feb. 19, 1975, 50-19917; Feb. 19, 1975, 50-19918; Feb. 24, 1975, 50-21857; Mar. 11, 1975, 50-28606; Mar. 11, 1975, 50-28607; Jun. 4, 1975, 50-66592; Jun. 4, 1975, 50-66593

Int. Cl.[4] C07C *69/74, 69/65*

U.S. Cl. 549—65 **9 Claims**

1. Ethyl 4,6,6-trichloro-3,3-dimethyl-5-hexenoate.

8. Ethyl 2-(β,β,β-trichloroethyl)-3,3-dimethylcyclopropanecarboxylate.

4,681,954
7,8,9,10-TETRAHYDRO-6-OXO-6H-DIBENZO(B,D-)PYRANYLOXY-PROPANES

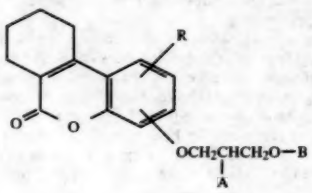
Ronald C. Griffith, Pittsford Monroe, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 7, 1985, Ser. No. 784,978

Int. Cl.[4] C07D *311/08*

U.S. Cl. 549—280 **22 Claims**

1. A compound having the formula:



I

where R represents hydrogen or (C_1–C_4)alkyl: where A represents chlorine or hydroxyl; and where B represents, hydrogen (C_1–C_4)alkyl, 7-coumarinyl, phosphono, phenyl, or phenyl substituted with amino, dimethylamino, hydroxyl, methoxyl, carboxyl, carboxymethyl, or 2-carboxyethenyl (HOOC—CH=CH—) provided that when A is hydroxyl, B can not be hydrogen.

4,681,955
BENZO-FUSED FLUORINATED HETEROCYCLIC COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

Albrecht Marhold, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

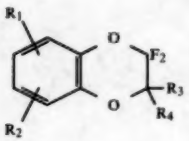
Filed Aug. 6, 1985, Ser. No. 762,984

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431222

Int. Cl.[4] C07D *319/20, 319/22*

U.S. Cl. 549—362 **13 Claims**

1. A benzo-fused fluorinated heterocyclic compound of the formula



(I)

in which

R_1 and R_2 each independently is H, F, Cl, Br, COF, COCl, CO-O-alkyl, CN, alkyl, NO_2, SO_2F, SO_2Cl, OCF_3, OCF_2Cl, SCF_3, CF_3, SCF_2Cl, phenyl, substituted phenyl, O-alkyl, O-aryl, S-alkyl or S-aryl, or

R_1 and R_2 together are

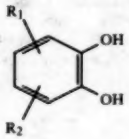
R_3 is alkyl, aryl, CO-O-alkyl, CN, substituted alkyl or substituted aryl, and

R_4 is alkyl, aryl, CO-O-alkyl, CN, substituted alkyl or substituted aryl.

6. A process for the preparation of a compound according to claim 1,

which comprises

(a) reacting a pyrocatechol of the formula



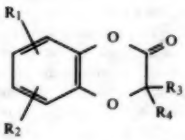
with a carbonyl-containing compound of the formula

in which

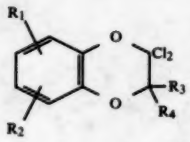
X is halogen, O-alkyl, S-alkyl or hydroxy and

Y is halogen,

in the presence of a solvent and with the addition of a condensing agent, to produce a benzodioxenone of the formula



(b) reacting the benzodioxenone at elevated temperature with phosphorus pentachloride to produce a dichlorobenzodioxene of the formula



and

(c) reacting the dichlorobenzodioxene with a fluorinating agent.

4,681,956

CATALYST COMPOSITION FOR EFFECTING METATHESIS OF OLEFINS

Richard R. Schrock, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 25, 1985, Ser. No. 780,049

Int. Cl.[4] C07F 11/00

U.S. Cl. 556—12 **7 Claims**

1. A catalyst suitable for the metathesis of an olefin having the formula:

$$M(NR^1)(OR^2)_2(CHR^3)$$

wherein:

R^1 and R^2 are alkyl, aryl, aralkyl, haloalkyl, haloaryl, haloaralkyl or a silicon-containing analog thereof; and R^3 is alkyl, aryl, aralkyl or a substituent resulting from the reaction of the M=CHR[3] moiety of said catalyst with an olefin being metathesized and wherein M is Mo or W.

4,681,957

METHOD OF PREPARING HYDROCARBON SUBSTITUTED DITHIOCARBAMATES OF MOLYBDENUM

Gopal H. Singhal, Houston, and Claude C. Culross, Baytown, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 3, 1985, Ser. No. 771,865

Int. Cl.[4] C07F 11/00

U.S. Cl. 556—38 **5 Claims**

1. A method for preparing a dihydrocarbyl substituted dithiocarbamate of molybdenum comprising the steps of:

(a) adding an alkali metal hydroxide to a mixture of a dihydrocarbyl substituted amine, carbon disulfide and water and allowing the alkali metal hydroxide, the dihydrocarbyl substituted amine and the carbon disulfide to react to produce an alkali metal salt of a dihydrocarbyl substituted ditiocarbamate in an inert atmosphere and at a temperature within the range from about −5° to about 30° C.;

(b) combining at least a portion of the alkali metal salt of the dihydrocarbyl substituted dithiocarbamate from step (a) with an alkali metal molybdate and acidifying the resulting combination at a pH within the range from about 3.5 to about 5.5 in an inert atmosphere and at a temperature within the range from about −5° to about 5° C. to produce a dihydrocarbyl substituted dithiocarbamate of molybdenum; and

(c) recovering a dihydrocarbyl substituted dithiocarbamate of molybdenum.

4,681,958

DITHIOACID VANADIUM SULFIDE DIMER COMPOSITIONS

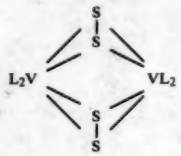
Thomas R. Halbert, Annandale, and Edward I. Stiefel, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 15, 1985, Ser. No. 787,154

Int. Cl.[4] C07F 9/00

U.S. Cl. 556—42 **14 Claims**

2. Neutral vanadium sulfide dimer complex of the general formula $L_2VS_4VL_2$ having the structure:



wherein L is a 1,1-dithioacid.

4,681,959

PREPARATION OF INSOLUBLE METAL ALKOXIDES

Richard J. Ayen, Darien, Conn.; Johst H. Burk, Mohegan Lake, and Carl C. Greco, Garnerville, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 22, 1985, Ser. No. 725,847

Int. Cl.[4] C07F 7/28, 7/00, 1/00, 3/00, 5/00, 5/02

U.S. Cl. 556—54 **17 Claims**

1. A process for the production of metal alkoxides selected from the group consisting of alkoxides of strontium, barium, gallium, indium, boron, yttrium, titanium, zirconium, and hafnium, said alkoxides being insoluble in organic solvents, which process comprises:

(a) reacting a halide of an at least divalent metal with an alcohol to form an intermediate compound, said intermediate compound being a halo alkoxy metal compound; and

(b) reacting the intermediate compound of (a) with an alcohol, said alcohol forming part of an organic solvent system, in the presence of a hydrogen halide acceptor, said hydrogen halide acceptor forming a hydrogen halide compound soluble in the organic solvent system.

4,681,960

ORGANOGERMANIUM COMPOUND

Norihiro Kakimoto; Takashi Katayama, both of Tokyo; Tadahiko Hazato, Saitama, and Tsutomu Ohnishi, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo, Japan

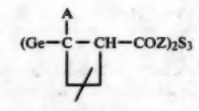
Filed Jul. 2, 1984, Ser. No. 626,787

Claims priority, application Japan, Jul. 1, 1983, 58-119856; Jul. 11, 1983, 58-125725

Int. Cl.[4] C07F 7/30

U.S. Cl. 556—83 **7 Claims**

1. An organogermanium compound having the formula:



wherein A represents a lower alkyl group or a phenyl group; when A represents a lower alkyl group, B represents a lower alkyl group connected to the same carbon atom and Z represents a hydroxyl or amino group; when A represents a phenyl group, B represents a hydrogen atom or a lower alkyl group

and Z represents a hydroxyl or amino group; said alkyl group selected from the group consisting of methyl, ethyl and propyl.

4,681,961

ADHESION PROMOTERS FOR THE PRODUCTION OF VOLCANIZATES HAVING A FAVORABLE FILLER/ELASTOMER BOND

Dieter Zerpner; Roland Streck, and Horst G. Haag, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 827,695

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504241; Aug. 14, 1985, 3529109

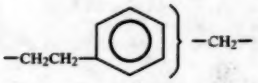
Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—428 7 Claims

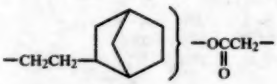
1. An oligosulfane mixture of the formula

$$(RO)_3Si—Y—S_x—Y—Si(OR)_3$$

wherein R is methyl or ethyl, which residues R can be identical or different, x is the number of S atoms in the individual compounds and Y is



or



wherein the free ethylene linkage in each case is bonded to silicon and wherein the symbol } refers to substitution at either of the two encompassed positions in the individual compounds and in each case indicates a mixture of isomers;
the oligosulfane being characterized by a value V of 2–6 which is the number of S atoms, based on two Si atoms, as determined by elementary analyses.

4,681,962

NOVEL 7-FLUORO-DIHYDRO PGI COMPOUNDS

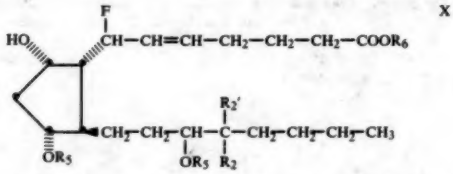
George W. Holland, North Caldwell; Hans Maag, Upper Montclair, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 747,740, Jun. 24, 1985, Pat. No. 4,634,782. This application Sep. 8, 1986, Ser. No. 885,994

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—441 3 Claims

1. A composition selected from the group consisting of compounds of the formula:



wherein R_6 is hydrogen or lower alkyl; R_2 is hydrogen, methyl or fluoro, R_2' is fluoro, hydrogen, trifluoromethyl or methyl; R_5 is tri(lower alkyl)silyl; with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl;
optical antipodes or racemates thereof.

4,681,963

HYDROSILYLATION CATALYST, METHOD FOR MAKING AND USE

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 810,629, Dec. 19, 1985. This application Dec. 9, 1986, Ser. No. 939,915

Int. Cl.[4] C07F 7/08, 7/10

U.S. Cl. 556—453 2 Claims

1. A method which comprises effecting reaction between a silicon hydride and a vinyl siloxane in the presence of a platinum colloid catalyst comprising a colloidal hydrosilylation catalyst comprising:

(A) the reaction product of

(i) a silicon hydride or siloxane hydride, and

(ii) from 6 to 50 moles of ≡SiH of (i) per mole of platinum in a Pt(O) or Pt(II) complex of at least one ligand selected from a member of the class consisting of phosphines, halides, $C_{(1-8)}$ alkyl radicals, $C_{(6-14)}$ aryl radicals, $C_{(1-8)}$ aliphatically unsaturated organic radicals, cyanide and carbon monoxide, and

(B) 2 to 20 parts by weight of aprotic solvent per part of (A).

4,681,964

METHOD OF INCREASING THE REACTIVITY OF PHOSPHORUS PENTASULFIDE

Dennis C. Annarelli, Newtown, Pa., and Frank J. Dominiani, Jr., Flemington, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 11, 1985, Ser. No. 700,208

Int. Cl.[4] C07F 9/165

U.S. Cl. 558—112 10 Claims

1. The method for accelerating the alcoholysis or phenolysis of phosphorus pentasulfide which comprises contacting phosphorus pentasulfide with an alcohol or phenol in the presence of a catalytic amount of a catalyst consisting essentially of a member selected from the group consisting of water, phosphoric acid and its metal salts, and sulfuric acid.

4,681,965

PHOSPHORUS CONTAINING AROMATIC AMINO POLYOLS

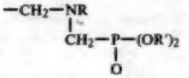
George P. Speranza; Michael E. Brennan, both of Austin, and Robert A. Grigsby, Jr., Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,503

Int. Cl.[4] C07F 9/40

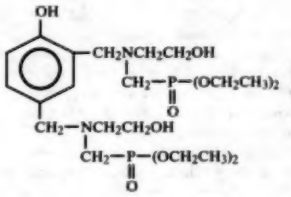
U.S. Cl. 558—162 7 Claims

1. A compound comprising a phenol which is substituted by a phosphorus containing structure having the formula:



in which R is an alkanol or polyoxyalkylene group, and R′ is an alkyl group, said compound being a polyol.

7. A compound having the formula:



4,681,966

INTERMEDIATE FOR THIOL BASED COLLAGENASE INHIBITORS

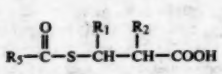
David K. Donald, High Wycombe; Michael M. Hann, Watlington; John Saunders, Ickford, and Harry J. Wadsworth, High Wycombe, all of Great Britain, assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 703,973, Feb. 21, 1985, which is a continuation-in-part of Ser. No. 685,180, Dec. 21, 1984. This application Apr. 2, 1986, Ser. No. 847,367

Int. Cl.[4] C07C *153/023, 153/017*

U.S. Cl. 558—255 1 Claim

1. A compound of the formula



wherein R_1 represents lower alkyl, phenyl, or phenyl lower alkyl; R_2 represents lower alkyl; and R_5 represents lower alkyl.

4,681,967

TRANSESTERIFICATION OF CARBOXYLIC OR CARBONIC ESTERS

Michael J. Green, Hedon, England, assignor to BP Chemicals Limited, London, England

Division of Ser. No. 551,863, Nov. 15, 1983, Pat. No. 4,559,188. This application Aug. 23, 1985, Ser. No. 768,960

Claims priority, application United Kingdom, Nov. 26, 1982, 8233765; Jan. 7, 1983, 8300444

Int. Cl.[4] C07C *67/02, 68/06*

U.S. Cl. 558—277 8 Claims

1. A process for the transesterification of a carboxylic or carbonic acid ester which process essentially consists of reacting the carboxylic or carbonic acid ester under transesterification conditions with an alcohol in the presence, as catalyst, of a cyclic amidine,

wherein the cyclic amidine forms part of a fused ring system containing six and five membered rings, or six and seven membered rings, or two six membered rings.

4,681,968

METHOD OF PRODUCING ADIPONITRILE

Dean T. Tsou, Solon; Marc W. Blachman, Lyndhurst, and James D. Burrington, Richmond Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 26, 1985, Ser. No. 705,937

Int. Cl.[4] C07C *120/00, 121/26*

U.S. Cl. 558—361 12 Claims

1. In a process for the production of adiponitrile from acrylonitrile comprising:

(a) mixing a first row transition metal salt, a metallic reducing agent selected from Mg, Mn and Zn, acrylonitrile and an organic amide solvent to form a first solution;

(b) heating said first solution for a time sufficient to form an active transition metal complex; and

(c) adding a quench solution to said first solution to liberate said transition metal from said complex and produce adiponitrile, said quench solution comprising a proton donor material having $0 < pk_a < 12$ and an organic solvent for the proton donor material,

the improvement wherein said quench solution comprises an organic proton donor dissolved in an organic amide solvent, wherein said quench solution contains from zero up to a maximum of 2 moles of methanol per mole of proton donor.

4,681,969

PROCESS FOR THE PREPARATION OF AN ENANTIOMERIC PAIR OF ISOMERS OF CYFLUTHRIN

John Williams, and Michael J. Robson, both of Berkshire, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 26, 1985, Ser. No. 769,493

Claims priority, application United Kingdom, Sep. 11, 1984, 8422872

Int. Cl.[4] C07C *121/75*

U.S. Cl. 558—407 6 Claims

1. A process for obtaining an enhanced yield of a crystalline material consisting essentially of the enantiomeric pair of isomers represented by (S)-α-cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (R)-α-cyano-4-fluoro-3-phenoxybenzyl (1S,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate in racemic proportions and substantially free from any other isomer of α-cyano-4-fluoro-3-phenoxybenzyl-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate, which comprises the steps of:

(a) Forming a concentrated solution of (RS)-α-cyano-3-phenoxybenzyl (1RS,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate which is free from trans isomer, with an organic solvent selected from lower alkanols containing up to six carbon atoms,

(b) adjusting the temperature of the solution to a temperature within the range −10° C. to 25° C. and adding a quantity of crystals of the enantiomeric pair of isomers to the solution, the added crystals remaining thereafter in the solid undissolved state,

(c) maintaining the solution at a temperature within the said range for a sufficient period to allow the crystalline material to precipitate from the solution,

(d) separating the precipitated crystalline material from the solution, and

(e) optionally, if required, subjecting the crystalline material to recrystallisation,

characterised in that a base is present during at least step (c) of the process whereby at least a proportion of the enantiomeric pair of isomers represented by (R)-α-cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (S)-α-cyano-4-fluorophenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate is converted to the enantiomeric pair of isomers represented by (S)-α-cyano-4-fluoro-3-phenoxybenzyl (1R,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate and (R)-α-cyano-4-fluoro-3-phenoxybenzyl (1S,cis)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate.

4,681,970

BICYCLO-SUBSTITUTED PHENYLACETONITRILE DERIVATIVES

Chi-Dean Liang, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

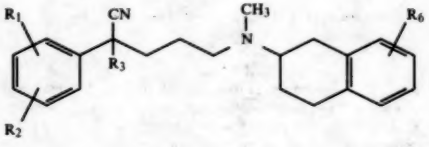
Continuation-in-part of Ser. No. 789,255, Oct., 1985, Pat. No. 4,593,042. This application Mar. 21, 1986, Ser. No. 842,688

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] C07C *121/78*

U.S. Cl. 558—408 6 Claims

1. A compound of the formula



wherein R_1 and R_2 are the same or different and each is se-

lected from hydrogen, halo, C_1–C_4 alkoxy or trifluoromethyl; R_3 is straight or branched chain alkyl of from about 1 to 15 carbon atoms; and R_6 is selected from hydrogen, C_1–C_4 alkyl, or C_1–C_4 alkoxy.

4,681,971

PHENYL SUBSTITUTED AMINODICARBOXYLATE ESTERS

Johannes Pfenninger, Marly; Abul Iqbal, Ettingen, and Alain C. Rochat, Fribourg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

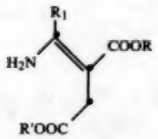
Filed Nov. 1, 1985, Ser. No. 793,868

Claims priority, application Switzerland, Nov. 7, 1984, 5358/84

Int. Cl.⁴ C07C *121/52, 101/28, 149/40, 79/46*

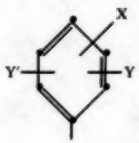
U.S. Cl. 558—414 **3 Claims**

1. An aminodicarboxylate ester of the formula



wherein

R_1 is a radical of the formula



wherein each of X, Y and Y′ independently is a hydrogen or halogen atom, a carbamoyl, trifluoromethyl, cyano, C_2–C_6alkylcarbamoyl, C_1–C_6 alkyl, C_1–C_6alkoxy, C_1–C_6alkylmercapto, C_2–C_6alkoxycarbonyl, C_2–C_6alkanoylamino or C_2–C_6alkylamino group; or is a phenoxy, phenylmercapto, phenoxycarbonyl, phenylcarbamoyl or benzoylamino group each unsubstituted or substituted by halogen, C_1–C_6alkyl or C_1–C_6alkoxy, at least one of the substituents X, Y and Y′ being a hydrogen atom, and

R and R′ are the same or different and are C_1–C_{18}alkyl, cyclohexyl, phenyl or said phenyl substituted by nitro, chlorine, C_1–C_6alkyl or C_1–C_6alkoxy.

4,681,972

SEPARATION OF DIASTEREOMERS

James S. Kaltenbronn, and Michael A. Stier, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 16, 1986, Ser. No. 908,438

Int. Cl.⁴ C07B *57/00*

U.S. Cl. 560—29 **3 Claims**

1. A process for separating S,S-isomers of Boc-benztine or Boc-cyclotine from diastereomeric mixtures thereof which comprises the steps of:

(1) contacting the mixture with the R-(+) alpha-methylbenzylamine or R-(+)-1-(1-naphthyl)-ethylamine to produce a salt,

(2) fractionally crystallizing from an acetate/alcohol solution one or more times to yield crystals in which the S,S-isomer predominates, and

(3) regenerating the acid.

4,681,973

DIRECT N-ACYLATION OF AMINO ACIDS

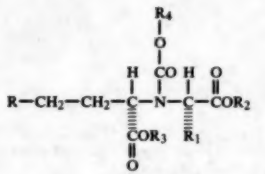
Martin L. Kantor, Mamaroneck, N.Y., assignor to USV Pharmaceutical Corporation, Fort Washington, D.C.

Filed Feb. 27, 1986, Ser. No. 833,706

Int. Cl.⁴ C07C *125/06*

U.S. Cl. 560—33 **10 Claims**

1. A process of preparing a compound of the formula



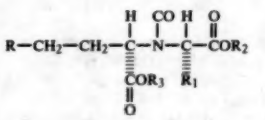
wherein:

R is H, lower alkyl, aryl, aryl lower alkyl, dimethylamino lower alkyl, halo lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, mercapto lower alkyl, lower alkoxy, lower alkenoxy, acylamino lower alkoxy, aryloxy, or aryloxy lower alkoxy;

R_1 is, lower alkyl, aryl, aryl lower alkyl, acylamino lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, mercapto lower alkyl, or lower alkylthio lower alkyl;

R_2 and R_3 are independently H, lower alkyl, di(lower alkyl-)amino, cycloalkyl, polycycloalkyl, cycloalkyl lower alkyl or aryl lower alkyl provided that at least one of R_2 or R_3 is hydrogen, and R_4 is 2,2,2-trichloroethyl; comprising the steps of:

(a) reacting a compound of the formula:



with a compound of formula:

R_4OCOCl III

wherein R_1, R_2, R_3 and R_4 denote a radical group as defined above, in the reaction solvent methylene chloride;

(b) completing the reaction by the addition of pyridine;

(c) washing the reaction mixture with hydrochloric acid;

(d) washing the reaction mixture with water;

(e) separating the organic solvent from the mixture and obtaining a solid residue;

(f) dissolving said solid residue in cyclohexane;

(g) crystalizing the dissolved residue; and

(h) separating the so obtained crystals from cyclohexane.

4,681,974

FLUORINE-CONTAINING POLYMER

Iwao Hisamoto, and Masayuki Yamana, both of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

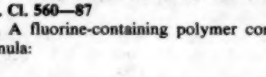
Filed Apr. 23, 1985, Ser. No. 726,323

Claims priority, application Japan, Apr. 28, 1984, 59-87100

Int. Cl.⁴ C07C *69/773, 69/80, 69/67, 93/04*

U.S. Cl. 560—87 **8 Claims**

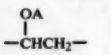
1. A fluorine-containing polymer comprising units of the formula:



wherein R^1 and R^2 are, the same or different, a group of the formula:

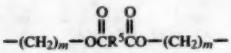
$$R_f(CH_2)_nY_k- \quad \text{(II)}$$

wherein R_f is a C_3–C_{21} fluorine-containing aliphatic group which may contain at least one oxy group, Y is a group of the formula:



(III)

wherein A is hydrogen or a lower acyl group, n is an integer of 0 to 8, k is 0 or 1; R^3 and R^4 are, the same or different, hydrogen or a lower acyl group, and Q^1 and Q^2 are, the same or different, a C_3–C_{120} oxyalkylene group optionally having a hydroxyl group, or a group of the formula:



(IV)

wherein R^5 is a C_3–C_{120} alkylene group optionally having an oxy group or a C_6–C_{15} aromatic group and m is an integer of 1 to 8; said polymer having a number average molecular weight of 5000 to 100,000.

4,681,975

POLYESTER

Ryuichi Hasegawa, and Kohji Hayashi, both of Kuwana, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Continuation of Ser. No. 478,105, Mar. 23, 1983, Pat. No. 4,596,886. This application Mar. 13, 1986, Ser. No. 839,278

Claims priority, application Japan, Apr. 30, 1982, 57-73205; Jun. 24, 1982, 57-109042; Jun. 25, 1982, 57-109613

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.[4] C07C *69/773*

U.S. Cl. 560—90 **6 Claims**

1. A plasticizer which is liquid at 25° C., which comprises: a polybasic acid, a polyhydric alcohol and a monohydric alcohol or a monobasic acid as a molecular weight controlling agent as its reactive monomer constituents, in a ratio of 1.0 equivalent of said polybasic acid to 0.1 to 3 equivalents of said polyhydric alcohol, wherein the polyhydric alcohol is composed of at least 20% by weight of 1,2-butanediol in an amount which is sufficient to impart plasticizing properties to said plasticizer.

4,681,976

PROCESS FOR PREPARING ALKYL SUBSTITUTED AND UNSUBSTITUTED PARA-CARBOALKOXY CYCLOHEXANONES

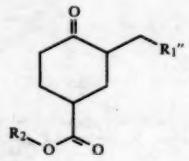
Mark A. Sprecker, Sea Bright; Wilhelmus J. Wiegers, Red Bank; Robert P. Belko, Woodbridge, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 726,603, Apr. 23, 1985, Pat. No. 4,629,805, which is a division of Ser. No. 563,801, Dec. 21, 1983, Pat. No. 4,537,704. This application Mar. 21, 1986, Ser. No. 842,783

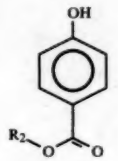
Int. Cl.[4] C07C *69/74;* C11B *9/00*

U.S. Cl. 560—126 **1 Claim**

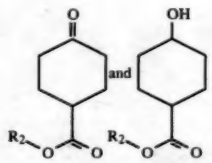
1. The process for preparing the compound having the structure:



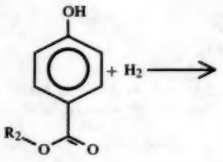
wherein R_1'' represents C_1–C_6 alkyl and R_2 is selected from the group consisting of ethyl and methyl comprising the step of reacting the compound having the structure:

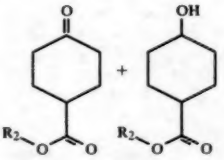


with the hydrogen in order to create a mixture of compounds having the structures:

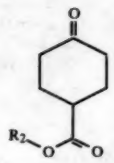


using a palladium catalyst at temperatures in the range of from about 130° up to about 170° C. and pressures in the range of from about 40 psig up to about 100 psig in accordance with the reaction:

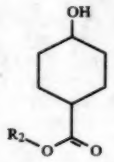




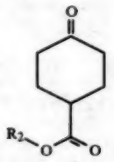
and separating by means of fractional distillation the compound having the structure:



from the compound having the structure:



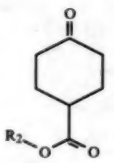
and then reacting the compound having the structure:



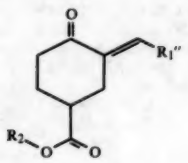
with an aldehyde defined according to the structure:

in the presence of hydrogen chloride gas at a temperature in the range of from about $-10°$ C. up to about $+10°$ C. and in the presence of a solvent inert to the reactants or products of reaction, the mole ratio of aldehyde defined according to the structure:

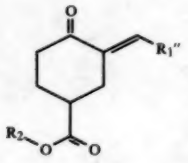
to ketone defined according to the structure:



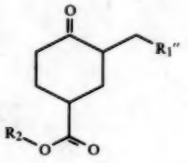
being from about 0.5:1.5 up to about 1.5:0.5 thereby forming the compound having the structure:



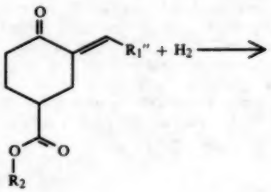
and then reacting the compound having the structure:

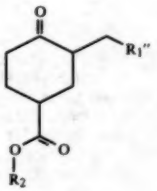


with hydrogen in order to form the compound having the structure:

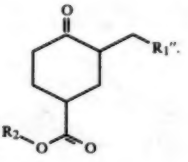


according to the reaction:





using a palladium on carbon or palladium on calcium carbonate catalyst, at a pressure in the range of 35 psig up to about 150 psig in the presence of an inert solvent and separating by means of fractional distillation the compound having the structure:



4,681,977

PREPARATION OF CHLORO-OLEFINS

Eberhard Steckhan, Meckenheim; Reinhard Wolf, Koenigswinter-Thomasberg, and Hermann Puetter, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

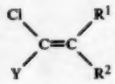
Filed Jun. 27, 1985, Ser. No. 749,423

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423762

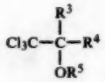
Int. Cl.[4] C07C *67/317*

U.S. Cl. 560—262 5 Claims

1. A process for the preparation of a chloroolefin of the formula:



where Y is chlorine or hydrogen, R^1 is hydrogen, alkyl of 1 to 3 carbon atoms or a radical which, together with R^2 forms a cycloaliphatic C_4- to C_8-ring, R^2 is a carboxyl, carbalkoxy or a hydrocarbon radical which contains 1 to 12 carbon atoms and which may contain halogen atoms or hydroxyl or keto groups, or a radical which, together with R^1 forms a cycloaliphatic C_4- to C_8-ring, wherein a trichloromethyl compound of the formula



where R^3 is hydrogen, alkyl of 1 to 3 carbon atoms or a radical which, together with R^4 forms a cycloaliphatic C_4- to C_8-ring, R^4 is a carboxyl, carbalkoxy, or a hydrocarbon radical which contains 1 to 12 carbon atoms and which may contain halogen atoms or hydroxyl or keto groups, or a radical which, together with R^3 forms a cycloaliphatic C_4-C_8-ring or a radical which, together with $—OR^5$ forms a 4- to 6-membered cyclic ether or a lactone ring, and R^5 is hydrogen, alkyl, acyl or a radical, which, together with R^4 forms a 4- to 6-membered cyclic ether or a lactone ring, is treated with a chromium(II) salt in an aqueous medium at from −35° to 110° C.

4,681,978

PROCESS FOR PRODUCING 2,6-NAPHTHALENEDICARBOXYLIC ACID

Takashi Yamauchi; Shoichiro Hayashi, and Atsushi Sasakawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,249

Claims priority, application Japan, Sep. 10, 1984, 59-189442

Int. Cl.[4] C07C *51/265*

U.S. Cl. 562—413 6 Claims

1. A process for producing 2,6-naphthalenedicarboxylic acid, comprising (1) oxidizing 2,6-diisopropylnaphthalene in a lower fatty acid as a solvent in the presence of a catalyst comprising a water-soluble cobalt salt, a water-soluble manganese salt, or mixture thereof in an amount of at least 0.5 gram-atom of Co, Mn or mixture thereof to 1 mol of 2,6-diisopropylnaphthalene by a molecular oxygen-containing gas, thereby obtaining 6-isopropyl-2-naphthoic acid and (2) further oxidizing the thus obtained 6-isopropyl-2-naphthoic acid in the lower fatty acid in the presence of the catalyst comprising a water-soluble cobalt salt, a water-soluble manganese salt or mixture thereof in an amount of from 0.0025 to 0.12 gram-atom to 1 mol of 6-isopropyl-2-naphthoic acid by the molecular oxygen-containing gas.

4,681,979

METHOD FOR PRODUCING COMPOUNDS HAVING A DOUBLE BOND AT THE TERMINAL

Masashi Araki, Takatsuki, and Takuo Hibi, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

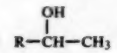
Filed Nov. 3, 1986, Ser. No. 925,920

Claims priority, application Japan, Nov. 11, 1985, 60-252574

Int. Cl.[4] C07C *1/24*

U.S. Cl. 585—640 11 Claims

1. A method for producing a compound having a double bond at an end of the molecule, comprising dehydrating a compound represented by the general formula



(I)

wherein R is a C_2–C_{20} hydrocarbon group having optionally double bonds, in the presence of a zirconium oxide catalyst treated with alkali solution.

4,681,980

METHOD FOR IMPROVING AN ELECTRICAL INSULATING HYDROCARBON

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 563,742, Dec. 20, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 795,366

Claims priority, application Japan, Dec. 25, 1982, 57-233238; Jul. 20, 1983, 58-132331

Int. Cl.[4] H01B *3/22*

U.S. Cl. 585—6.3 5 Claims

1. A method of preparing an electrical insulating compositin which comprises:

(a) alkylating at least one aromatic hydrocarbon with an alkylating agent in the presence of an alkylating catalyst to produce an alkylation product, said alkylation product comprising unreacted substances, mono and polyalkylated aromatic hydrocarbons, diarylalkanes and heavier products;

(b) recovering a fraction comprising diarylalkanes as a feedstock;

(c) dehydrogenation said feedstock in the presence of a dehydrogenation catalyst under conditions effective to provide a dehydrogenation reaction mixture comprising at least 0.5% by weight of aromatic monoolefin or diolefin having two condensed or two noncondensed aromatic nuclei and at least 10% by weight of unreacted feedstock and to provide a bromine number of said dehydrogenation reaction mixture which is at least 0.4 cg/g higher than the bromine number of said feedstock; and

(d) recovering said reaction mixture.

4,681,981

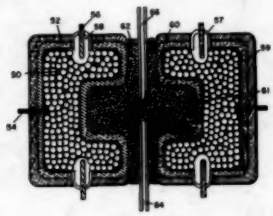
THERMOVOLTAIC CELLS

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 612,718, May 21, 1984, which is a continuation-in-part of Ser. No. 588,344, Mar. 12, 1984. This application Jul. 29, 1985, Ser. No. 760,111

Int. Cl.[4] H01L *35/30*

U.S. Cl. 136—205 7 Claims



1. An electric current-generating cell comprising:

an open-cellular foamed multiple thermocouple having a conductive matrix with a plurality of conductors of different material from said matrix embedded in said foam matrix with a portion of each conductor exposed on the inside of said cells;

a vessel containing such open-cellular foamed multiple thermocouple;

an electroconductor contacting a portion of said foam matrix;

means to excite said open-cellular foamed multiple thermocouple to produce electric current;

electrode means to carry said electric current outside said open-cellular foamed multiple thermocouple, said electrode means being further adapted to form said cells' output terminals, said electrode means further including:

a first electrode entered into said vessel and surrounded by said open-cellular foamed multiple thermocouple; and

a second electrode contiguous with said electroconductor contacting said foam matrix.

4,681,982

LIGHT-ELECTRICITY CONVERSION SEMICONDUCTOR DEVICE

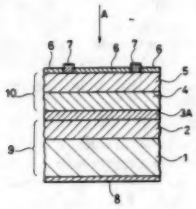
Susumu Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1986, Ser. No. 860,799

Claims priority, application Japan, May 8, 1985, 60-97031

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—249 1 Claim



1. A semiconductor light-electricity conversion device, comprising:

a Group III-V compound semiconductor region having a pn junction therein and comprising gallium and arsenic;

a silicon region having a pn junction, said two regions positioned in optical series relation;

a zinc seleniide layer inserted between said two regions; and

a plurality of electrodes for outputting light generated current from said two regions.

4,681,983

SEMICONDUCTOR SOLAR CELLS

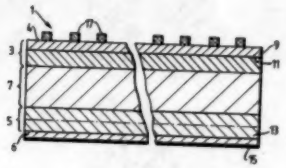
Tomas Markvart, and Arthur F. W. Willoughby, both of Southampton, England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 18, 1985, Ser. No. 777,343

Claims priority, application United Kingdom, Sep. 18, 1984, 8423558

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—255 11 Claims



1. A photovoltaic solar cell which comprises a piece of Czochralski-grown semiconductor material incorporating a first region which is p-type, a second region which is n-type, a p-n junction between the two and electrodes on different surfaces of the piece, a first electrode making contact with the first region and a second electrode making contact with the second region, wherein the piece incorporates in its body a lattice defect gettering zone and a defect denuded zone extending between the p-n junction and the lattice defect gettering zone, said denuded zone having a thickness of 100 microns or less as measured from a surface of said cell on which solar radiation is intended to fall.

4,681,984

SOLAR CELL COMPRISING A SEMICONDUCTOR BODY FORMED OF AMORPHOUS SILICON AND HAVING A LAYER SEQUENCE P-SIC/I/N

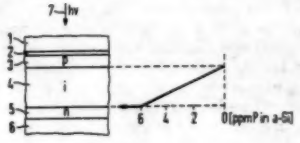
Matthias Moeller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,814

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3513012

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—258 8 Claims



1. A solar cell, comprising in sequence:

a transparent base electrode comprising doped stannic oxide;

a semiconductor body comprising amorphous silicon with an intrinsic i-layer between a p-type SiC layer and an n-type layer, said p-type SiC layer being in contact with the transparent base electrode;

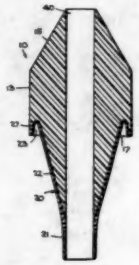
said intrinsic layer (i) having a phosphorus doping profile rising in the direction towards the i/n junction between the n-type layer and i-layer.

4,681,985

PREMOLDED MECHANICALLY PRESTRESSED VOLTAGE STRESS CONTROL CONES FOR HIGH VOLTAGE CABLES AND METHOD OF FABRICATING SAME

Carlos Katz, Edison; Attila F. Dima, Piscataway, and George S. Eager, Jr., Upper Montclair, all of N.J., assignors to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Filed Apr. 24, 1985, Ser. No. 726,781
Int. Cl.[4] H02G 15/068
U.S. Cl. 174—73 R 14 Claims



1. A premolded mechanically prestressed voltage stress control cone for high voltage cable termination comprising a body of cross-linked polymeric electrical insulating material having a straight through circular bore concentric with an axis of said body, the outer surface of said body defining a surface of revolution centered about said axis and having a contour in the direction parallel to said axis for controlling the electric field and reducing the maximum electrical voltage gradient to a non-degrading level when assembled with a high voltage cable, a tubular layer of semiconductive cross-linked polymeric material concentric with said axis and extending in one direction up over said body for a predetermined distance and extending in the opposite direction away from said body to define an extension of said bore, said layer being bonded to said body throughout the interface therebetween, and said body and layer having locked-in mechanical stresses that are releasable upon the application of heat to said materials to cause shrinkage in the radial direction of said body and layer for reducing the diameter of said bore.

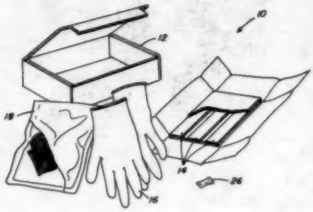
14. The method of fabricating a premolded mechanically prestressed voltage stress control cone for high voltage cable termination that comprises the steps of molding a body of cross-linkable polymeric electrical insulating material to have an outer surface configured to define a surface of revolution centered about an axis and having a contour in the direction parallel to said axis for controlling the electric field and reducing the maximum electrical voltage gradient to a non-degrading level when assembled with a given high voltage cable, bonding to said body a tubular layer of semiconductive cross-linkable polymeric material concentric with said axis and extending in one direction up over said body for a predetermined distance and extending in the opposite direction away from said body, forming a straight circular bore of first diameter through said body and said layer concentric with said axis said first diameter being smaller than the outside diameter of the insulation of the predetermined size high voltage cable with which said voltage control cone is intended to be assembled, cross-linking said respective materials and thereafter radially expanding said materials under appropriate thermal conditions to mechanically prestress said materials and radially expand said bore to a diameter sufficient to pass with at least a sliding fit over the insulation shield of said predetermined size cable.

4,681,986

SPLICE CONSTRUCTION FOR ELECTRICAL CABLE AND METHOD FOR MAKING THE SAME

Robert A. Settineri, Gibsonia, Pa., assignor to Royston Laboratories, Inc., Pittsburgh, Pa.

Filed Feb. 24, 1986, Ser. No. 832,072
Int. Cl.[4] H02G 15/08, 1/14
U.S. Cl. 174—84 R 13 Claims



1. A kit for use in forming a protective structure encapsulating structure about a splice in electroconductive cables, said kit comprising:

(a) a plurality of extensible and windable strips of a malleable, hand-moldable polymeric sealand adapted for hand molding about said splice, a sealant being characterized by a cold-flow property and a low-temperature brittleness property of less than −20° C.; and

(b) a hermetically-sealed container containing a restraining fabric impregnted with a resing which is adapted for winding around said sealant after it is molded about said splice and is curable, by contact with moisture, into a hard, moisture-resistant protective shield means for said sealant.

6. A splice construction of the type wherein ends from a plurality of electroconductive cables are spliced together by a splicing implement and enclosed within a protective structure, the improvement wherein said protective structure is formed of:

(a) a malleable, hand -moldable rubber composition molded about the splice itself and substantially enclosing said splicing implement;

(b) at least one strip of a rubber composition being stretched over said hand -moldable rubber position, said strip covering all exposed electroconductive metal of said splice construction; and

(c) a hard shield member substantially enclosing all of said rubber composition, said shield member formed of a moisture-cured resin on a fabric matrix.

8. A process for protecting a splice construction of a heavy electroconductive cable of the type used in cathodic protection, said process comprising the steps of:

(a) molding a tacky malleable rubber composition about a splice and substantially enclosing a splice implement;

(b) stretching a strip of said rubber composition over said molded composition to cover all exposed electroconductive metal of said splice construction;

(c) wrapping a fabric impregnated with a coldwater curable resin over said rubber composition; and

(d) curing said resin to a hard, protective composition.

4,681,987

ELECTRONIC EQUIPMENT HAVING A KEY INPUT FUNCTION

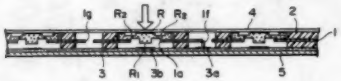
Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 567,502, Jan. 3, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 837,654

Claims priority, application Japan, Jan. 11, 1983, 58-1770; May 6, 1983, 58-78344; May 17, 1983, 58-84938

Int. Cl.[4] H01H *13/70;* **H05K** *7/10*

U.S. Cl. 200—5 A **12 Claims**



1. Electronic equipment having a key input function, comprising:

printed circuit board means having an electrical circuit including a plurality of stationary contacts (3*b*), a plurality of connecting contacts (3*a*) and a connecting pattern for connecting said stationary contacts with said connecting contacts;

frame means arranged on the surface of said printed circuit board means on which said electrical circuit is formed, said frame means including,

(1) an insulating layer of an electrically insulative material, said insulating layer having a hole corresponding to each of said stationary and connecting contacts, and

(2) a metal layer insertion-molded therein, said metal layer having at least one first portion corresponding to said connecting contact, in one of said holes and in contact with said corresponding connecting contact to provide fixed electrical connection between said first portion and said corresponding connecting contact and at least one second portion corresponding to said stationary contact, in another of said holes, wherein said second portion has an opening smaller than the insulating laver hole; and

key input means including a movable contact member associated with said second portion for providing selective electrical connection between said second portion and said corresponding stationary contact, wherein said movable contact member is partially mounted to said metal layer and has another portion abutting said printed circuit board in proximity of said stationary contact, and

wherein said frame means is mounted on said printed circuit board means such that said first portion and said second portion are aligned with said corresponding connecting contact and said corresponding stationary contact, respectively, and said movable contact is supported by said metal layer of said frame means.

4. Electronic equipment according to claim 1 further comprising a plurality of movable contact members, wherein each of said movable contact members electrically connects one of said stationary contacts to said electrical circuit through one of said first portions and one of said second portions when pressed.

4,681,988

SWITCH SELECTOR MECHANISM

George A. Hodkin, Loughborough, England, and Roger H. Blane, Krugersdorp, South Africa, assignors to Associated Electrical Industries Limited, England

Filed Jan. 16, 1986, Ser. No. 819,873

Claims priority, application United Kingdom, Jan. 16, 1985, 8501070

Int. Cl.[4] H01H *3/00*

U.S. Cl. 200—17 R **6 Claims**

1. A selector mechanism, comprising:

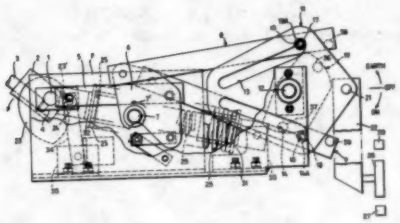
(a) an actuator;

(b) an actuating member movable under the control of the actuator;

(c) an operating member having a pair of elongated slots each having a recess adjacent one end, said operating member being pivotally movable in one or other direction from a neutral position;

(d) a pair of elongated links pivotally connected at one end to the actuating member and each link carrying, at a position spaced from said connected end, a projection engaging in a respective one of the slots in the operating member, each projection being located within a respective recess when the operating member is in said neutral position; and

(e) a selector device movable to cause a surface thereof to



engage one or other of the projections so as to retain the respective projection within its respective recess, to cause movement of the actuating member to be transmitted to the operating member, so as to pivot the operating member in the direction determined by movement of the respective link, while leaving the projection carried by the other link free to leave its respective recess and move along its slot.

3. The selector mechanism according to claim 1; and further comprising link means connected between the operating member and a movable conducting member of an interrupter/isolator assembly, for transmitting movement of the operating member to the conducting member so as to cause the latter to engage either an isolator or an earth contact in dependence upon the direction of movement of the operating member.

4,681,989

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

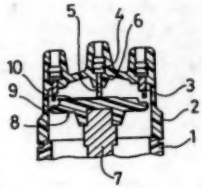
Naotaka Nakamura, Chita; Kenji Yagi, Nagoya; Shunzo Yamaguchi, Okazaki; Ichirou Yoshida, Kariya, and Morihiro Atsumi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 17, 1985, Ser. No. 810,225

Claims priority, application Japan, Dec. 20, 1984, 59-270270

Int. Cl.[4] F02P *7/02;* **H01C** *7/10;* **H01H** *19/00*

U.S. Cl. 200—19 R **3 Claims**



1. A distributor comprising:

a plurality of fixed electrodes adapted to be electrically

connected to a plurality of sparking plugs of an internal combustion engine, and

a rotating electrode adapted to be rotatable in synchronism with a crank of the internal combustion engine and forming a narrow gap sequentially with each of the said fixed electrodes,

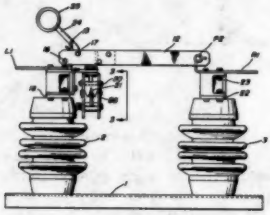
wherein it is featured that at least one of said plurality of fixed electrodes and said rotating electrode is made of a ceramic that has the function of a varistor and has as a main material at least one of zinc oxide (ZnO) and nickel oxide (NiO) and as an additive at least one of bismuth oxide (Bi_2O_3), manganese dioxide (MnO_2) and cobalt oxide (CoO), which are sintered together.

4,681,990

ELECTRIC BY-PASS SWITCH

Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed Sep. 15, 1986, Ser. No. 907,239
Int. Cl.[4] H01H *31/04*
U.S. Cl. 200—48 KB **15 Claims**



1. An electric switch comprising a pair of main fixed contacts insulated from each other, a pair of main movable contacts arranged to engage and to disengage said main fixed contacts respectively and insulated from each other, a an elongated by-pass switch electrically connected with and pivotally mounted at one end on one of said main fixed contacts and having its other end arranged electrically to connect and to disconnect the other of said main fixed contacts, latch means movably mounted on said by-pass switch and arranged to latch said by-pass switch closed whereby said fixed contacts are electrically interconnected, and actuator means mounted on and movable with said main movable contacts for engaging and imparting latching movement to said latch means in coordination with opening movement of said main movable contacts.

4,681,991

VIBRATING SENSING DEVICE

Francis J. Anderson, Foxrock, Co. Dublin, Ireland, assignor to Anderson Research and Development Limited, Ireland

Filed Feb. 11, 1986, Ser. No. 828,125
Claims priority, application Ireland, Feb. 11, 1985, 322/85
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R **34 Claims**

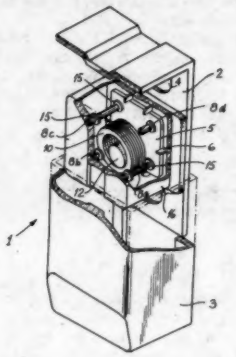
1. A vibration sensing device comprising:

a non-conductive base support member;

at least two spaced-apart electrically conductive and mutually electrically insulated supports forming a support assembly and mounted on the base support member;

a plurality of electrically conductive main inertia masses supported by and in electrical contact with the support assembly so as to form a first set of electrical connections which may be broken by vibration; and

an electrically conductive additional inertia mass supported by and in electrical contact with at least two of the main inertia masses so as to form a second set of electrical connections which may be broken by vibration, said main



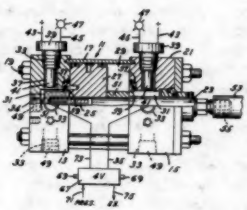
and additional inertia masses and support assembly forming part of an electrical monitoring circuit.

4,681,992

CUSHIONED CLAMP CYLINDER WITH PROXIMITY SWITCHES

Ronald J. Kazmierski, Mt. Clemens, Mich., assignor to C. M. Smillie & Company, Ferndale, Mich.

Filed Mar. 6, 1986, Ser. No. 836,738
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—82 E **6 Claims**



1. A cushioned clamp cylinder with proximity switches comprising a cylinder assembly including a cylinder having a spaced cap and head of square shape defining a plurality of right angularly related end faces, there being sealed opposed cushion chambers in said cap and head, there being a sensing port in each end face of said cap and head communicating with said cushion chamber;

a normally open proximity switch connected to a light and having an inductive probe selectively positioned into one of said sensing ports adjacent each cushioned chamber;

one sensing port of said cap and head being connected to a pressure conduit and the other two sensing ports being plugged;

said cylinder assembly including a piston rod mounting a reciprocal piston within said cylinder;

spaced inductive sleeves mounted on said piston rod alternately movable into said cushion chambers, for alternately activating the proximity switches as said piston bottoms at opposite ends of said cylinder;

a flexible annular insert ring axially positioned and retained within said cap and head respectively, having an internal annular wiping bead in sealing engagement with and centrally receiving said inductive sleeves for alternately sealing off said cushion chambers, the compressed air in

said chambers bringing said piston to a smooth stop as it bottoms out within said cylinder;

and an apertured bleed screw adjustably threaded into each cap and head laterally offset from an adjacent sensing port and in communication with said cushion chambers respectively, for regulating exhaust bleeding therefrom depending upon the load reactively applied to said piston, said proximity switches on alternately closing providing a visible indication of the respective bottoming out of said piston at opposite ends of said cylinder.

4,681,993

SPRING OPERATING MECHANISM FOR AN ELECTRICAL SWITCH

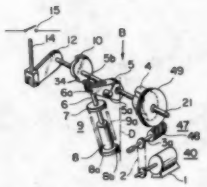
Tadashi Kondo, and Kiyoshi Yabe, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 24, 1986, Ser. No. 843,198

Claims priority, application Japan, Mar. 25, 1985, 60-44202[U]

Int. Cl.⁴ H01H *3/02*

U.S. Cl. 200—153 SC **4 Claims**



4. A device comprising:

a drive mechanism;

a drive lever having an engaging surface and connected to said drive mechanism for rotation about an axis;

an actuating lever rotatable about said axis independent of said drive lever and having a first and a second engagement surface, said first engagement surface engageable with said engaging surface of said drive lever and said actuating lever being rotated when said engaging surface of said drive lever engages and pushes said first engagement surface of said actuating lever;

an energy storing means connected in an over-center relationship to said actuating lever for selectively storing and releasing energy in accordance with the rotational movement of said actuating lever;

a driven lever rotatable about said axis independent of said drive lever and said actuating lever and having an engagement surface engageable with said second engagement surface of said actuating lever, said driven lever being rotated when said actuating lever rotates and said second engagement surface of said actuating lever pushes said engagement surface of said driven lever; and

a single common shaft for mounting thereon said drive lever, said actuating lever, and said driven lever.

4,681,994

HIGH PRECISION AND COMPACT CONTACT SWITCH

Kunio Nagata, Otokuni; Tatsuo Aoi, Ibaraki; Norio Iwakiri, Otokuni; Hiroshi Osumi, Kurayoshi; Nobuyuki Ogata, Kurayoshi, and Norihito Yamane, Kurayoshi, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

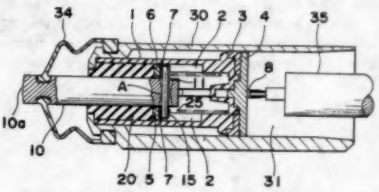
Filed Nov. 7, 1985, Ser. No. 795,767

Claims priority, application Japan, Nov. 13, 1984, 59-239646

Int. Cl.⁴ H01H *13/10*

U.S. Cl. 200—16 B **2 Claims**

1. A contact switch assembly which comprises a housing; a pair of fixed contact elements fixedly supported within the housing, a plunger having first and second ends opposite to each other and axially slidably extending into the housing with the first and second ends situated exteriorly and interiorly of the housing; a generally cylindrical movable contact member tiltably carried by the plunger adjacent the second end so as to extend transversely of the plunger, said movable contact member having its opposite end portions adapted to contact the respective fixed contact elements; a support piece for the support of the fixed contact elements and made of synthetic resin; and means for urging the movable contact member to cause the opposite end portions of said movable contact member to contact the respective fixed contact elements, and wherein said fixed contact elements are embedded in said support piece.



4,681,995

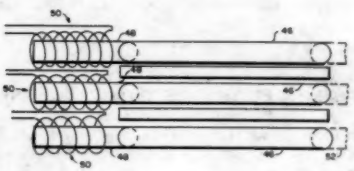
HEAT PIPE RING STACKED ASSEMBLY

Brian S. Ahern, 69 Middle Rd., Boxboro, Mass. 01719, and Joseph A. Adamski, 468 Central St., Framingham, Mass. 01701

Filed Apr. 4, 1986, Ser. No. 848,179

Int. Cl.⁴ H05B *6/10*

U.S. Cl. 219—10.51 **5 Claims**



1. A heat pipe for use in a crystal growth furnace, said heat pipe comprising:

a ring-shaped tubular body having a wall comprising a plurality of layers of refractory materials, the inside of said tubular body having a means for supporting capillary action of a working fluid placed inside said tubular body; and

at least one arm attached to said tubular body, said at least one arm being integrally attached to said tubular body on an external circumference and being substantially perpendicular to the axis through the center of said body, said at least one arm communicating with said inside of said tubular body and acting as a secondary heat pipe to convey heated working fluid to said ring-shaped tubular body.

4,681,996

ANALYTICAL PROCESS IN WHICH MATERIALS TO BE ANALYZED ARE DIRECTLY AND INDIRECTLY HEATED AND DRIED BY MICROWAVE RADIATION

Michael J. Collins, and Wyatt P. Hargett, Jr., both of Matthews, N.C., assignors to CEM Corporation, Matthews, N.C.

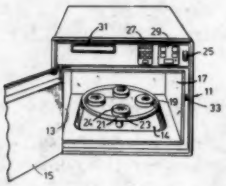
Division of Ser. No. 450,198, Dec. 16, 1982, Pat. No. 4,566,804. This application Dec. 19, 1985, Ser. No. 811,540

Int. Cl.⁴ H05B *6/78;* **G01N** *25/00*

U.S. Cl. 219—10.55 M **10 Claims**

1. A process for/analyzing a thermally sensitive material for its content of volatilizable components without degrading the material, which comprises supporting the material to be ana-

lyzed, which includes lossy and non-lossy volatilizable component(s), by means of a support which comprises 40 to 95% of a matrix material which is transmissive of microwave radiation, 5% to 60% of a microwave absorptive material dispersed in such matrix material, which microwave absorptive material has a Curie temperature in the range of 85° to 650° C., above which it becomes microwave transmissive, so as thereby to prevent excessive heating of the support and the material to be analyzed, which matrix material is stable and form retaining at the Curie temparature of the dispersed material, and directing microwave radiation onto the material to be analyzed and onto



the support for such material so as directly to heat the material when it contains lossy volatilizable component(s) and indirectly to heat such material by heating the support when the material to be analyzed no longer contains any lossy component(s), which support heats the material to a temperature no higher than the Curie temperature of the dispersed microwave absorptive material in the matrix of the support, at which temperature the material being analyzed is not degraded, and applying sufficient microwave radiation to bring the microwave absorptive material of the support to its Curie temperature.

4,681,997

WIRE-CUT, ELECTRIC DISCHARGE MACHINING POWER SUPPLY UNIT

Michiya Inoue, Hino; Haruki Obara, Sagamihara, and Shunzo Izumiya, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

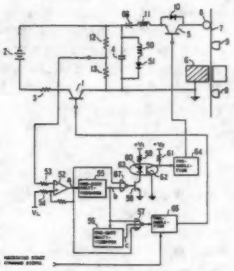
PCT No. PCT/JP84/00478, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01685, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 11, 1984, Ser. No. 744,486

Claims priority, application Japan, Oct. 12, 1983, 58-157839

Int. Cl.⁴ B23H *1/02*

U.S. Cl. 219—69 C **5 Claims**



1. A wire-cut, electric discharge machining power supply unit for use in machining a workpiece, comprising:

a DC power source;

a first switching element coupled to said DC power source;

a capacitor coupled to said DC power source and said first switching element, said capacitor being charged by said DC power source via said first switching element;

a second switching element coupled to said capacitor;

a wire electrode coupled to said second switching element and positioned adjacent the workpiece, the stored charges of said capacitor being discharged between the workpiece and said wire electrode via said second switching element; and

a series circuit, consisting of a diode and an inductance, connected in parallel to said capacitor, said diode being connected in a backward direction relative to the polarity of the charged voltage of said capacitor.

4,681,998

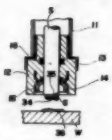
METHOD OF STUD WELDING AND WELDING GUN USED THEREFOR

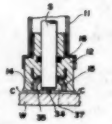
Toshiharu Kon, Yokohama, Japan, assignor to Nikkai Kensetsu Kabushiki Kaisha, Yokohama and O.S.E. Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,347

Int. Cl.⁴ B23K *9/20*

U.S. Cl. 219—99 **5 Claims**





1. A method of welding a metal stud having an electrode on its forward tip to a base material in an underwater environment comprising surrounding the tip of the stud in an annular, cup-shaped heat-resisting and resilient liquid sealing member that is open towards the base material, affixing a thermally decomposable gas generating agent to the tip of the stud, bringing the open side of the liquid sealing member tightly into contact with the base material to provide a sealed space for the tip of the stud, supplying electric current across the electrode of the stud and the base material to produce an arc and generate heat thereby causing the electrode to become molten and the gas generating agent to decompose and generate gas at a sufficently high enough pressure to instantaneously expel out of the liquid-sealing member any water present around the tip of the stud thereby establishing a water free atmosphere for the welding operation.

4,681,999

APPARATUS FOR WELDING DENTAL ELEMENTS

Arturo Hruska, Via G. Carducci 10, 00187 Rome, Italy

Filed Mar. 13, 1985, Ser. No. 711,100

Claims priority, application Italy, Jun. 20, 1984, 48426 A/84; Aug. 28, 1984, 48767 A/84

Int. Cl.⁴ B23K *11/26*

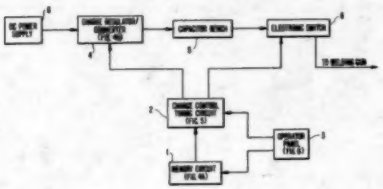
U.S. Cl. 219—111 **18 Claims**

10. An apparatus for performing a welding operation on dental crowns or bridges, said apparatus comprising:

memory means for storing welding sequence data pertaining to a plurality of selectable welding sequences, each of said welding sequences comprising a plurality of pulses, said welding sequence data comprising voltage potential data for each of said plurality of pulses;

operator control means for selecting at least one of said welding sequences for implementation during a desired welding operation, said operator control means generating corresponding control signals;

charge control timing means responsive to said control signals from said operator control means for generating charge control timing signals;



power supply means responsive to said charge control timing signals for generating a plurality of electrical pulses in accordance with said welding sequence data from said memory means corresponding to said at least one welding sequence selected by said operator control means; and

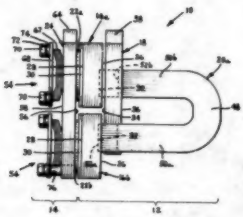
welding gun means responsive to said plurality of electrical pulses for performing said welding operation.

4,682,000

WELDING TRANSFORMER AND RECTIFIER ASSEMBLY

Gary E. Holt, Holland; Mark B. Siehling, and Stanley R. Van Antwerp, both of Hudsonville, all of Mich., assignors to Conrac Corporation, Hudsonville, Mich.

Filed Mar. 18, 1985, Ser. No. 712,796
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—116 **20 Claims**



8. A transformer/rectifier assembly comprising:

secondary coil means;

a pair of secondary connector pads electrically coupled to said coil means, each pad defining a rectifier face generally opposite said coil means;

a rectifier means overlying and abutting each secondary pad;

a rectified bus overlying and abutting said rectifier means; and

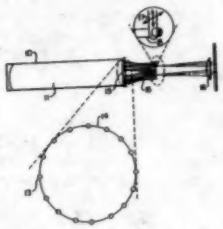
spring means for biasing said rectified bus toward said rectifier means, said spring means including means for independently adjusting the biasing force toward each rectifier means, said spring means further including a spring concentrically oriented with respect to each said rectifier means.

4,682,001

MULTI-LEAD LASER SOLDERING APPARATUS

Edward V. Locke, Rockport, Mass., assignor to Laser Corporation of America, Lowell, Mass.

Filed Jan. 24, 1986, Ser. No. 822,027
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **4 Claims**



1. Apparatus for simultaneously joining the leads of a multi-lead device to pads on a substrate, the apparatus comprising,

(a) a laser having a resonant cavity,

(b) a mirror disposed at one end of the resonant cavity, the mirror having a plurality of holes for outputting a plurality of beamlets of substantially collimated radiant energy, there being a beamlet for each lead to be simultaneously bonded of the multi-lead device,

(c) a corresponding plurality of elongate flexible optical wave guides, each beamlet entering the near end of a different one of the optical wave guides,

(d) adjustable means attached to each of the flexible optical wave guides for enabling the far end of each of those wave guides to be moved in two orthogonal planes whereby the far end of each of the optical wave guides may be independently positioned in different patterns which match the arrangement of the leads of different multi-lead devices,

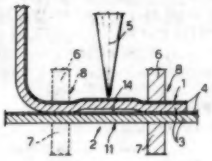
(e) means for focussing the beamlets emerging from the far ends of the wave guides upon the joints to be bonded such that the beamlets impinge upon the joints to be bonded at an acute angle to the substrate.

4,682,002

METHOD OF LASER WELDING SHEET METAL PROTECTED BY LOW-VAPORIZING-TEMPERATURE MATERIALS

Alberto Delle Piane, Bruino; Franco Sartorio, Turin; Maichi Cantello, Aglie', and Guglielmo Ghiringhello, Quincinetto, all of Italy, assignors to Prima Progetti S.p.A., Turin, Italy

Filed Oct. 31, 1984, Ser. No. 666,726
Claims priority, application Italy, Sep. 20, 1984, 67940 A/84
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD **10 Claims**



1. A method of laser welding a plurality of metal sheets, at least one of said sheets being protected by a layer of low-vaporizing-temperature material, the method comprising:

orienting said sheet in facing relationship in the weld area,

said layer of protective material being located between said two metal sheets in the weld area;

supporting said sheets so that the facing opposed surfaces thereof are in relatively loose contact in the weld area to permit the escape of gases from between said sheets in the weld area;

providing a low resistance path substantially parallel to and along at least a substantial part of the weld area for the escape of gases generated by the vaporization of said layer of protective material between said sheets in the weld area; and

sweeping the weld area with a laser beam emitted by a laser welding machine.

4,682,003

LASER BEAM GLASS CUTTING

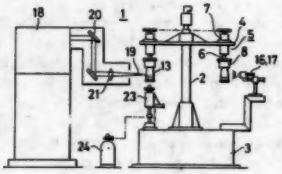
Takao Minakawa, Chiba; Shigeo Shiono, Ibaraki, and Junichi Nishihashi, Tokyo, all of Japan, assignors to Sasaki Glass Co., Ltd., Tokyo, Japan

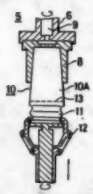
Filed Dec. 18, 1985, Ser. No. 810,187

Claims priority, application Japan, Apr. 3, 1985, 60-69014

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LN **9 Claims**





1. A method of fusion cutting glass using a laser beam to effect local heating of the glass, in which method the region of the glass to be cut is maintained at a high temperature below the softening point of the glass, the glass is then repeatedly irradiated with a laser beam to be fused along a required cut-off line while a downwardly directed tensile force is applied to a part to be cut off so that a rectangularly shaped cut edge is obtained.

4,682,004

MEASURING ARRANGEMENT HAVING A CAPACITIVE MEASURING ELECTRODE AND A WORKING TOOL WITH INTEGRATED ELECTRODE

Karl-Heinz Schmall, Baden-Baden, Fed. Rep. of Germany, assignor to GET Gesellschaft fur Elektronik-Technologie mbH, Baden-Baden, Fed. Rep. of Germany

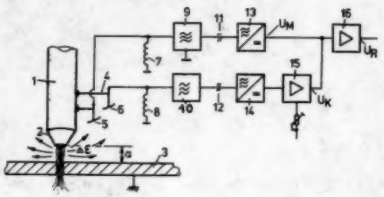
Filed Feb. 3, 1986, Ser. No. 825,144

Claims priority, application Switzerland, Feb. 8, 1985, 581/85

Int. Cl.⁴ B23K *15/00*

U.S. Cl. 219—121 PC **12 Claims**

1. A measuring arrangement for measuring the spacing between a metal workpiece and a thermal tool when working on the workpiece, the arrangement comprising a thermal tool adustably mounted for working on a metal workpiece when in use, a capacitive measuring electrode fixed to said tool so as to leave a space between itself and said workpiece in a region in which heat is developed by said tool when in use, a compensation capacitive electrode fixed to said tool so as to leave a space between itself and said workpiece in a region in which heat is developed by said tool when in use, an atmosphere providing a common dielectric between said capacitive measuring electrode and said compensation capacitive electrode on the one hand and said workpiece on the other hand, said compensation capacitive electrode being positioned to produce a different spacing-dependent capacitance with respect to said workpiece



from that of said capacitive measuring electrode, a measuring electric circuit including said measuring electrode for producing signals related to said spacing-dependent capacitance of said capacitive measuring electrode, a compensating electric circuit including said compensation electrode for producing signals related to said spacing-dependent capacitance of said compensation capacitive electrode, and means for receiving said signals from said measuring and said compensating circuits and combining them to produce an output dependent substantially only on the positions of said capacitive electrodes.

4,682,005

PLASMA WELDING OR CUTTING TORCH PROVIDED WITH A NOZZLE CARTRIDGE

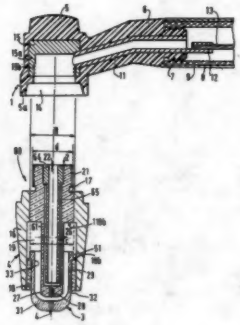
Gérard Marhic, Cergy, France, assignor to Lair Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 18, 1986, Ser. No. 830,113

Claims priority, application France, Feb. 22, 1985, 85 02553

Int. Cl.⁴ B23K *15/00*

U.S. Cl. 219—121 PM **9 Claims**



1. A plasma welding and cutting torch comprising a torch body having an interior, a source of plasma-producing gas connected to said interior, an annular skirt connected to the torch body and comprising at least a seat and a rear abutment, an electrode disposed in the skirt, an electrical supply conductor connected to the electrode, a plasma outlet nozzle freely slidably mounted in the skirt in facing relatio to and at a variable distance from the electrode and provided with a plasma outlet orifice, the nozzle being movable between said seat and

said rear abutment and applicable against said seat solely under the effect of an elastic force.

4,682,006

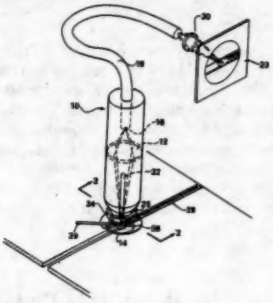
SELF-CLAMPING ARC LIGHT REFLECTOR FOR WELDING TORCH

Stephen S. Gordon, Tarzana, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 783,890, Oct. 3, 1985, Pat. No. 4,633,060. This application Sep. 30, 1986, Ser. No. 913,447

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—124.34 **9 Claims**



1. In an electric arc welding torch having a housing with an internal viewing system for viewing the weld area, the improvement comprising:

an annular member on the end of the torch housing adjacent the welding area,

said annular member having an internal reflective surface coaxially with the end of the arc welding torch and extending outwardly therefrom for reflecting the arc light onto the welding area thereby providing a more even light distribution and a clearer image for the internal optical viewing system,

said annular member having a vertical split at one location along its circumference whereby adjacent ends forming the split may be spread to place or remove the annular member from the end of the torch housing.

4,682,007

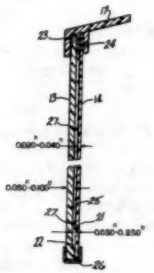
DEFOGGING AND DEICING SHIELD STRUCTURE

James M. Hollander, Main St., Goshen, Mass. 01032

Filed Apr. 17, 1986, Ser. No. 853,169

Int. Cl.[4] H05B *3/26*

U.S. Cl. 219—211 **19 Claims**



1. In a protective helmet and face shield assembly including fastener means for securing the shield releasably to the helmet and hinge means between the fastener means and the shield permitting relative motion between the shield and the helmet an improved face shield comprising:

at least two spaced, plastic lenses providing a field of view, one lens defining a face lens and another lens defining a weather lens, a surface of one of said lenses being imprinted solely by silk screening with an electrically conductive circuit substantially throughout said field of view, said circuit being arranged upon said surface in accordance with a pattern of spaced, continuous, generally parallel lines, said lines at maximum width and minimum spacing occupying no more than about eight percent (8%), per unit area, of said field of view, said field of view being otherwise free of coatings or films.

4,682,008

SELF-TEMPERATURE CONTROL TYPE GLOW PLUG

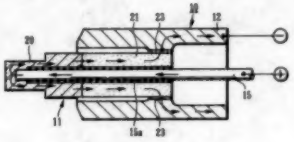
Mitsuke Masaka, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 836,831

Claims priority, application Japan, Mar. 22, 1985, 60-55988; Mar. 22, 1985, 60-55989; Mar. 22, 1985, 60-55990; Mar. 22, 1985, 60-55991; Mar. 22, 1985, 60-55992

Int. Cl.[4] H05B *3/00*; **F02P** *19/02*

U.S. Cl. 219—270 **20 Claims**



1. A self-temperature control type glow plug comprising a rod heater held at a front end of a hollow metal holder and having one end extending outside said hollow metal holder, said rod heater including a heating section made of a conductive ceramic material with a small positive temperature coefficient and a control section made of a conductive ceramic material with a positive temperature coefficient larger than that of said heating section, said heating section being formed integrally with said control section.

4,682,009

WALL MOUNTED COMBINED RADIACTIVE-CONVECTIVE ELECTRIC SPACE HEATER

Roland Meiser, Ehningen; Josef Burkert, and Ralf Bendel, both of Bad Mergentheim, all of Fed. Rep. of Germany, assignors to Thermotechnik G. Bauknecht GmbH, Fellbach and Reinhold Barlian, Bad Mergentheim, both of, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,513

Int. Cl.[4] F24H *3/00*; **H05B** *3/00*

U.S. Cl. 219—377 **13 Claims**

1. A space heating apparatus for mounting on a wall surface of a room to be heated, the apparatus comprising:

a housing including a substantially flat rear wall adapted for mounting to the wall surface, and a front wall adjacent said rear wall, said front wall and said rear wall conjointly defining a space therebetween through which the air to be heated passes, said front wall having a lower portion extending upwardly from the bottom of said housing a solid uninterrupted mid portion devoid of any openings and an upper portion extending upwardly from said mid portion to the top of said housing;

an inlet means at the lower end of said housing for admitting and directing the air into said space;

air outlet means at the upper end of said housing whereat the heated air leaves said space and passes from said housing;

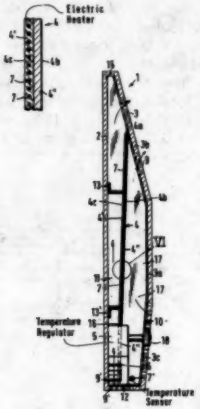
a solid, uninterrupted metal plate having a first flat side and a second flat side;

an electrically insulating plastic layer formed only on said first flat side of said metal plate so as to leave said second side as an uncovered and exposed metal surface;

said metal plate being mounted in said space so as to partition said space into two convecting channels and having an upper portion extending above said mid portion of said front wall;

said plastic layer and said rear wall conjointly defining one of said convecting channels for communicating with a portion of said air outlet means and for conducting a portion of the incoming air admitted to said space as it moves upwardly to said portion of said air outlet means;

said second flat side and said front wall with said solid uninterrupted mid portion conjointly defining the other one of said convecting channels for communicating with the reminder of said air outlet means and for conducting the remainder of the incoming air admitted to said space as it moves upwardly to said remainder of said air outlet means;



resistance heating means embedded in and throughout said plastic layer for heating the air rising in both of said convecting channels and for radiating heat from said second flat side of said plate; and,

said remainder of said outlet means being formed in the upper portion of said front wall so as to be disposed laterally of said upper portion of said metal plate thereby permitting at least a portion of the heat radiated from said second flat side of said metal plate to pass therethrough directly into the room to be heated.

4,682,010

IN-LINE ELECTRIC HEATER FOR AN AEROSOL DELIVERY SYSTEM

Donald F. Drapeau, Windsor; Benjamin N. Moore, Haddam, and Henry B. Hall, Madison, all of Conn., assignors to Safeway Products, Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 472,761, Mar. 7, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 723,034

Int. Cl.[4] **H05B** *3/00;* **F24H** *3/00;* **A61M** *16/00;* **H01C** *3/00*

U.S. Cl. 219—381 **11 Claims**

1. An in-line heater for an aerosol delivery system comprising:

an elongated tubular electrically insulated body having first and second ends coaxially aligned along the major axis of said tubular body, said first and second ends containing an aerosol inlet and outlet, respectively, said body further having an unrestricted flow passage therein from the first to the second end, and first and second terminal housings adjacent said first and second ends thereof;

a first electrical terminal positioned in the first terminal housing of said tubular body;

a second electrical terminal positioned in the second terminal housing of said tubular body; and

heating means connected to said first and second terminals, said heating means comprising an elongated strip of electrically conductive mesh of very low mass so as to be

almost instantaneously responsive and self supporting, the conductive mesh strip axially extending and being spirally wound within the tubular body to loosely fill the tubular body from its first end to its second end and to extend substantially across the space between the sidewalls of the tubular body so that the maximum surface area of the mesh strip heating means is exposed to the aerosol mixture passing through the tubular body thereby minimizing the impedance, interruption and restriction of the aerosol flow.

4,682,011

FURNACE FOR THE PARTIAL HEAT TREATMENT OF WORK TOOLS

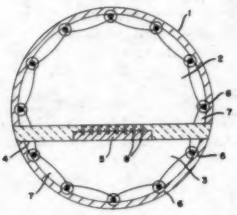
Gerhard Hoffmann, Kahl; Rudolf Bauer, Eschborn; Paul Heilmann, Maintal, and Erwin Schumann, Bruchköbel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 599,306, Apr. 12, 1984, abandoned. This application Nov. 5, 1985, Ser. No. 795,292

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313651

Int. Cl.[4] **H05B** *3/62*

U.S. Cl. 219—390 **10 Claims**



1. A furnace for the controlled partial heat treatment of work tools comprising a vacuum one-chamber furnace provided with compressed gas quenching for the partial heat treatment of work tools, each of said tools having a working region and a clamping region, support means (5), located inside said chamber, adapted for releasably positioning the clamping region of at least one work tool, said furnace having an interior space and provided with all-around heating in the form of heating means located inside said furnace interior space, said support means (5) being integrated in a plate (4) made of heat insulating material, which plate subdivides said furnace interior space into two separate heating section chambers (2, 3), each of said separate heating section chambers (2, 3) provided by separately controllable heating means, there being no cooling means for cooling of work tools during the heat treatment and without heating the clamping region of said work tools beyond their material specific conversion temperature.

4,682,012

APPARATUS FOR CONTROLLING AND ADJUSTING HEAT OUTPUT DURING THE HEATING PHASE OF A COOKING VESSEL

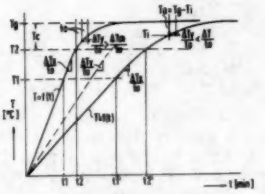
Kurt Wolf, and Wolfram K. Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,840

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505233

Int. Cl.[4] H05B 1/02

U.S. Cl. 219—490 **16 Claims**



1. An apparatus having a control circuit means for controlling and adjusting heat output of a heating element during the heating phase of a cooking vessel operable in at least a first and a second mode of operation prior to reaching a first and a second preset cooking temperature, respectively, said apparatus comprising:

switch means for selectively activating said heating element according to one of said first and second modes of operation;

temperature sensor means (TF) for continuously measuring an actual temperature (Ti) at said cooking vessel;

base measurement circuit means (MO) in communication with said temperature sensor means (TF) and said control circuit means (HSt) for monitoring said actual temperature measurements (Ti) and signalling said control circuit means when a first trigger temperature (T1) in said first mode of operation or a third trigger temperature (T3) in said second mode of operation has been reached;

first switch circuit means (S1) in communication with said temperature sensor means (TF) for measuring a first temperature increase (ΔTx) during consecutive preset time intervals (to);

second switch circuit means (S2) in communication with said first switch circuit means (S1) for receiving said first temperature increase measurements (ΔTx) and conveying said first temperature increase measurements (ΔTx) to a first program memory means (PSP1) after said first trigger temperature (T1) has been reached and before a second trigger temperature (T2) greater than said first trigger temperature (T1) and less than said first preset cooking temperature (Tg) has been reached in said first mode of operation;

third switch circuit means (S3) in communication with said temperature sensor (TF) for measuring a second temperature increase (ΔTy) during consecutive said preset time intervals (to) after said second trigger temperature (T2) and said third trigger temperature (T3) in said first and second modes of operation, respectively, have been reached and until said first preset cooking temperature (Tg) and said second preset cooking temperature (Tw) have been reached, respectively;

comparison circuit means (V) in communication with said third switch circuit means (S3) for receiving said second temperature increase measurements (ΔTy) and comparing each said second temperature increase (ΔTy) to a preset minimum temperature increase (ΔTm); signalling said control circuit (HSt) when said second temperature increase (ΔTy) is less than said preset minimum temperature increase (ΔTm); and signalling a second program memory means (PSP2) when said second temperature increase (ΔTy) is equal to and greater than said preset minimum temperature increase (ΔTm);

measurement circuit means (M3) in communication with said temperature sensor means (TF) for measuring a temperature differential (Ta) between said measured actual temperature (Ti) and said first and second preset cooking temperatures (Tg, Tw) in said first and second modes of operation, respectively, when said second temperature increase (ΔTy) is equal to and greater than said preset minimum temperature increase (ΔTm) during the preceding said preset time interval (to); and

said control circuit means (HSt) in communication with said base measurement circuit (MO), said first and second program memory means (PSP1, PSP2), and said heating element for maintaining said heating element at a first preset output until said first trigger temperature (T1) and said third trigger temperature (T3) are reached in said first and second modes of operation, respectively; regulating said heating element according to said first and second program memory means (PSP1, PSP2); and maintaining said heating element at a second preset output when said second temperature increase (ΔTy) is equal to and greater than said preset minimum temperature increase (ΔTm).

4,682,013

APPARATUS FOR CONTROLLING THE COOKING PROCESS IN A PRESSURE COOKER

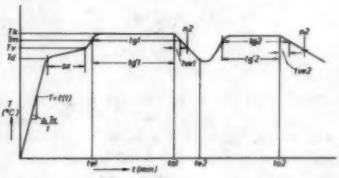
Wolfram K. Andre, and Kurt Wolf, both of Wildbad, Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 811,004

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447296

Int. Cl.[4] H05B 1/02

U.S. Cl. 219—497 **20 Claims**



1. Apparatus for controlling a cooking process comprising at least two cooking phases separated by an interruption in a cooking system with a pressure cooker heated by a heating element and controlled by a control circuit, said apparatus comprising: a temperature sensor means (TF) detecting and emitting signals indicating the temperature at said pressure cooker; an adjustable timing means (ZG) for presetting a desired preset cooking time (tg1, tg2); a temperature selector means (TW) adjustable to at least a first preset cooking temperature (Tk) and a second preset cooking temperature (Tk') lower than said first preset cooking temperature (Tk); differentiating means (DG) receiving said temperature signals from said temperature sensor means (TF) and determining a slope (ΔTx/t) of a temperature-time curve characteristic of said cooking system during a heating up period in each said cooking phase; a temperature measurement means (TM) in communication with a time measurement means (ZM), said temperature measurement means detecting when a measurement temperature (Tm) is reached and signalling said time measurement means (ZM) when a temperature Td corresponding to a vapor phase temperature and a temperature Tv corresponding to an evaporation temperature is reached in each said cooking phase, and said time measuring means (ZM) measuring a time interval (sx) therebetween; a control circuit means (L) receiving signals corresponding to said slope (ΔTx/t), said measurement temperature (Tm), said time interval (sx), said preset cooking time

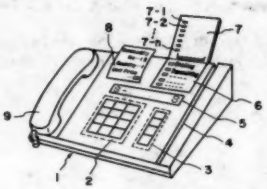
(tg1, tg2), and said preset cooking temperature (Tk, Tk'), said control circuit means (L) commencing measurement of said preset cooking time (tg1, tg2) when said measurement temperature (Tm) signal is received, said control circuit means (L) determining an adjustment time interval (tvx1, tvx2) for at least one said cooking phase, said adjustment time interval (tvx1, tvx2) proportional to said time interval (sx) and inversely proportional to said slope (ΔTx/t), and said control circuit means (L) subtracting said adjustment time interval (tvx1, tvx2) from said preset cooking time (tg1, tg2) to determine a shortened cooking time; and a switching means (Z) dividing said cooking process into said successive cooking phases, said switching means (Z) signalling said control circuit (L) to store said measured values for said slope (ΔTx/t), and said time interval (sx) for the preceding said cooking phase, said control circuit means (L) retrieving and utilizing said measured values in subsequent said cooking phases to determine said adjustment time intervals (tvx1, tvx2).

4,682,014

SIMPLE DATA INPUT APPARATUS

Teruhiko Iwama, Kawasaki, Japan, assignor to Nitsuko Limited, Kanagawa, Japan

Filed Jan. 2, 1986, Ser. No. 815,486
Int. Cl.[4] G06F *15/20*
U.S. Cl. 235—375 **7 Claims**



1. A simple data input apparatus having a magnetic card reader, a memory for storing data read by said magnetic card reader, and an input guide section having a plurality of indicating lamps, said apparatus being provided with an input guide sheet having input items printed on a surface thereof for inputting of data to said apparatus and including a magnetic strip having the order in which these items are to be indicated stored thereon in advance, wherein the input items stored on said magnetic strip are read by said card reader and stored in said memory, after which said input guide sheet is placed on said input guide section and said indicating lamps are lighted in dependence upon data stored in said memory and in accordance with the input items printed on said input guide sheet.

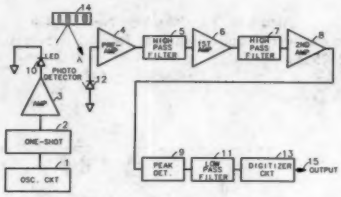
4,682,015

LOW POWERED HIGH AMBIENT LIGHT BAR CODE READER CIRCUIT

Ronald Quan, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 7, 1985, Ser. No. 709,472
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **8 Claims**

1. A low power bar code reader detection circuit comprising:
- an oscillation circuit for driving a light-emitting device, having a low duty cycle and high frequency, to provide a pulse-modulated light source;
- a photodetector for detecting reflected pulse-modulated light images from a bar code and for providing an image signal in response thereto;
- a plurality of amplifier stages connected to the photodetector for amplifying the image signal, wherein the amplifier stages conduct substantially only upon peak amplitudes of the image signal,
- a peak modulation detector means connected to the final stage of the plurality of amplifier stages for demodulating and holding the peak amplitude of the amplified image



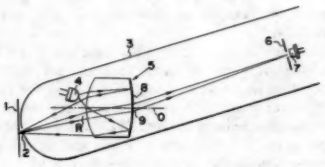
signal, the peak modulation detector means demodulating peak amplitude without the means of a detector diode; and
- a digitizing circuit connected to the peak modulation detector means, the digitizing circuit having the detected image signal as an input signal for digitizing.

4,682,016

PEN-TYPE BAR CODE READER

Toshiyuki Inoue, Yamanashi, Japan, assignor to Nisshin Kohki Co., Ltd., Nagano, Japan

Filed Jul. 9, 1985, Ser. No. 753,197
Claims priority, application Japan, Jul. 20, 1984, 59-109848[U]
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **6 Claims**



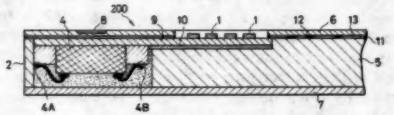
1. A pen-type bar code reader comprising:
- a generally pen-shaped holder;
- a bar code detector provided at one end of said holder;
- a receptor provided within said holder and spaced from said detector;
- a convex lens system provided within said holder and interposed between and spaced from said detector and receptor, said convex lens system being disposed so that the optical axis thereof is angled with respect to the center ray of a detection light flux from said detector to said receptor;
- a bar code illumination light source provided within said holder and disposed at a position between said convex lens system and said detector and symmetric to said light flux with respect to said optical axis; and
- a reflector provided on a surface of said convex lens system curved away from said detector, except a region for transmitting said detection light flux, to concentrate or focus light rays from said light source to said detector.

4,682,017

SHOCK-RESISTANT INTEGRATED CIRCUIT CARD

Yoshihiko Nakahara; Masao Muramatsu, and Kouichi Ueno, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Japan

Filed Dec. 24, 1985, Ser. No. 813,036
Claims priority, application Japan, Dec. 29, 1984, 59-277734
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—492 8 Claims



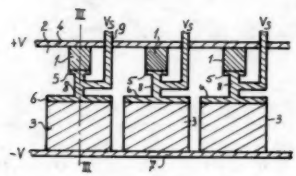
1. A shock-resistant integrated circuit card, comprising:
(a) an elongated carrier having at least one long side and an exterior surface;
(b) an integrated circuit mounted within the carrier and having interior terminals located within the carrier at a marginal edge region adjacent said one long side;
(c) exterior terminals mounted on the carrier and exposed to said exterior surface, said exterior terminals being located at a remote region spaced apart from said marginal edge region; and
(d) a flexible circuitboard supported by the carrier and extending between said marginal edge region and said remote region, said flexible board flexibly and electrically interconnecting the interior and exterior terminals to maintain an electromechanical connection therebetween despite the application of forces tending to deform the card.

4,682,018

PROCESS FOR THE TEMPERATURE COMPENSATION OF A PHOTOCONDUCTING DETECTOR

Jean P. Moy, St. Egreve, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 27, 1984, Ser. No. 686,870
Claims priority, application France, Jan. 3, 1984, 84 00030
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 R 5 Claims



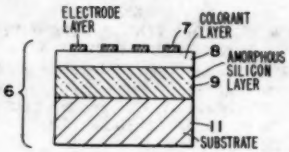
1. A photodetector comprising an output mode terminal and a pair of voltage supply terminals, a photoconductor means having first and second ends of which the first is connected to one of the voltage supply terminals and the second to the output mode terminal, a resistor means having first and second ends of which the first is connected to the other of the voltage supply terminals and the second to the output mode terminal, the photoconductor and resistor means each comprising a separate layer of the same semiconductor materials on a common substrate, the layer of the photoconductor means being open to incident radiation to be detected, the layer of the resistor means being closed to such radiation.

4,682,019

AMORPHOUS SILICON PHOTOELECTRIC TRANSDUCER WITH A PHOTOCONDUCTIVE COLORANT LAYER

Hisashi Nakatsui; Hiroyuki Imataki, both of Kawasaki, and Yoshioki Hajimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 735,511, May 20, 1985, which is a continuation of Ser. No. 344,799, Feb. 1, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,116
Claims priority, application Japan, Feb. 9, 1981, 56-17752
Int. Cl.[4] H01L *31/04*
U.S. Cl. 250—211 R 4 Claims



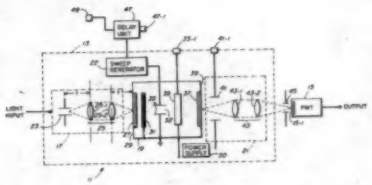
1. A photosensitive transducer which comprises, in sequence, a substrate, a photoconductive amorphous silicon layer and a colorant layer comprising a photoconductive dye or pigment adapted to provide said amorphous silicon layer with enhanced photoconductivity and modified spectral sensitivity.

4,682,020

PICOSECOND GATED LIGHT DETECTOR

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463

Filed Mar. 1, 1984, Ser. No. 585,214
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT 8 Claims



1. A light detector having an ultrafast input gate for use in measuring the intensity of a light signal over an ultrashort time window, said light detector comprising:
a. a streak camera for receiving said light signal and producing a streak image of the light signal over an ultrashort time window,
b. a photomultiplier tube for measuring the intensity of the light in at least a portion of the streak image produced by the streak camera and producing an analog electrical output signal corresponding to the intensity of the light so measured,
c. said streak camera comprising:
i. a streak camera tube, said streak camera tube having an input end, an output end, a photocathode at the input end, a phosphor screen at the output end and a pair of sweeping electrodes between the input end and the output end, the streak image produced by the streak camera being formed on the phosphor screen
ii. an input slit,
iii. input relay optics for imaging the input slit onto the photocathode,
iv. output relay optics for imaging the streak image

formed on the phosphor screen onto the photomultiplier tube,

v. a sweep generator for driving the sweeping electrodes, and

vi. aperture means between the phosphor screen and the ouput relay optics for limiting the portion of the streak image formed on the phosphor screen that is collected by the relay lens and imaged onto the photomultiplier tube, and

d. a delay unit coupled to the sweep generator for delaying the output signal of the sweep generator,

e. the sweep generator together with the size of the streak image defining the size of the ultrashort time window.

4,682,021

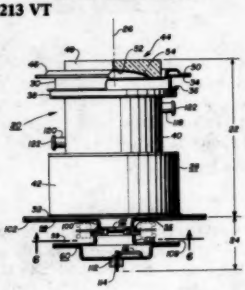
HEADER ASSEMBLY FOR AN INTENSIFIED CHARGE COUPLED IMAGE SENSOR

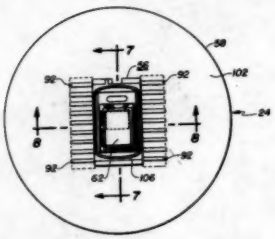
Robert W. Fitts, Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 29, 1986, Ser. No. 823,536

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **5 Claims**





1. In an intensified charge-coupled image sensor having a longitudinally extending optical axis, said image sensor comprising

an image intensifier section including an envelope having therein a photoemissive cathode for emitting photoelectrons in a pattern corresponding to the intensity of radiation incident thereon, and

a header assembly including a charge-coupled device for receiving the photoelectrons from said cathode, an insulative header for retaining said charge-coupled device, a header input member attached between said insulative header and said image intensifier section, and closure means for closing the output end of said header assembly, wherein the improvement comprises

said insulative header including a plurality of substantially rectangular insulative members joined together in layers to form a hermetic, dimensionally stable, thermally inert structure, said header having a first major surface and an oppositely disposed second major surface, an imaging aperture formed in the header and having a sidewall, the imaging aperture being disposed about the optical axis of the image sensor, means for preventing electrostatic charge buildup on the first major surface of the header and on the sidewall bordering the imaging aperture, an electrode surface having a plurality of discrete electrode pads disposed between two of the insulative members of the header, the electrode pads extending outwardly from the periphery of the imaging aperture, half of the contact pads being located at spaced intervals along one long side of the header and the other half of the contact pads being located at spaced intervals along the other long side of the header, each of the contact pads being connected to a different outwardly extending electrical lead, the electrical leads being arranged in oppositely disposed rows,

the header input member having a substantially rectangular portion attached to the first major surface of the header and an annular portion attached to the image intensifier section of the image sensor, and

the closure means including a header output member having a substantially rectangular portion attached to the second major surface of the header and an end portion closed by an end-closure cap.

4,682,022

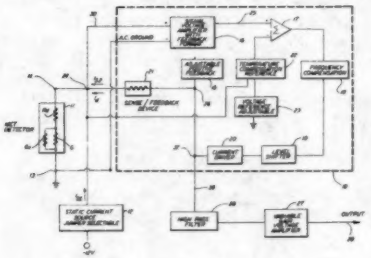
DETECTOR PREAMPLIFIER FOR USE WITH A MCT DETECTOR

Robert A. Hoult, Bethel, and Robert P. Ragusa, New Milford, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 21, 1985, Ser. No. 704,355

Int. Cl.[4] H03K *3/01, 3/26, 3/42*

U.S. Cl. 250—214 A **12 Claims**



1. A preamplifier having particular utility for a detector that exhibits a fixed electrical resistance effect and a conductance effect which changes with incident light intensity, comprising:

means for providing to the detector a substantially fixed voltage potential and a current that varies with a change in the detector conductance;

means responsive to said current for providing an output signal being indicative of the incident light intensity on the detector; and

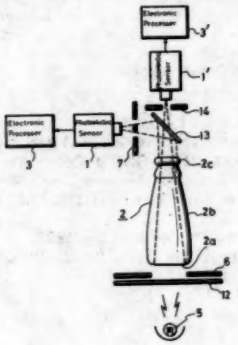
positive feedback circuit means for substantially offsetting any nonlinearity caused by the fixed electrical resistance effect of the detector to thereby linearize said output signal, said positive feedback circuit means being connected to said providing means and comprising means for providing a negative resistance effect to substantially nullify the electrical resistance effect of the detector.

4,682,023

BOTTLE SIDEWALL DEFECT DETECTOR EMPLOYING MASKING MEANS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,639
Claims priority, application Japan, Mar. 12, 1985, 60-48689
Int. Cl.[4] G01N 9/04
U.S. Cl. 250—223 B 4 Claims



1. A defect inspection apparatus for bottles made of transparent meterial comprising:

a light source located under a bottle made of transparent material and to be inspected for irradiating a bottom of said bottle;

a photoelectric conversion sensor installed above a mouth of said bottle for receiving such a light that enters said bottle from its bottom, passes through the inside of the sidewall of said bottle and then is emitted upwards from the said mouth and;

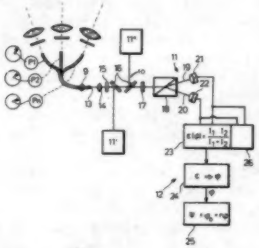
an electric processer for electrically processing a responsive electrical signal from said photoelectric conversion sensor to thereby inspect defects of said bottle.

4,682,024

LASER RADIATION WARNING SENSOR UTILIZING POLARIZATION

Thorsteinn Halldorsson, Munich, and Ernst A. Seiffarth, Taufkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,240
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513350
Int. Cl.[4] G01J 1/20
U.S. Cl. 250—225 14 Claims



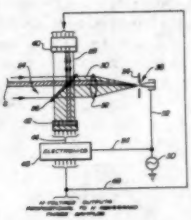
1. Apparatus for the recognition and directional detection of optical radiation, especially laser radiation, including at least two optical input systems having two different directions of view with defined fields of view, and having respective light guide paths leading to a detector comprising a polarimeter and circuit means coupled to the detector for evaluating a signal from the detector, the respective light guide paths each having therein a polarization means for the linear polarization of radiation incident on the respective optical systems, said light guide paths terminating in an end facing the detector, said polarization means in each light guide path determining at said end facing the detector a specific direction of polarization different from the direction of polarization of each of the other light guide paths, said circuit means comprising means for determining a direction of each of the incident laser radiation as a function of the direction of polarization determined by said polarimeter.

4,682,025

ACTIVE MIRROR WAVEFRONT SENSOR

Peter M. Livingston, Palos Verdes Estates, and Jean C. Shelton, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 599,871, Apr. 13, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 919,542
Int. Cl.[4] G01J 1/20; G01B 11/00
U.S. Cl. 250—201 39 Claims



1. An active mirror wavefront sensor, comprising:

beam splitting means for splitting an input beam into a reference-arm beam and a sample beam;

means for generating a reference beam from the reference-arm beam;

means for modulating the reference beam with a high-frequency dither signal;

means for recombining the sample beam and the reference beam to produce an interference pattern;

multi-element detection means positioned to provide electrical signals indicative of the interference pattern;

multiple electrical circuits connected one to each element of the detection means, and each including synchronous detector means for removing dither-frequency components from the electrical signals, and means to provide a phase correction signal from the electrical signals;

elemental deformable mirror means positioned to effect wavefront changes in the sample beam; and

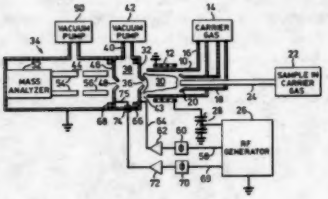
means for coupling the phase correction signals to the deformable mirror means, whereby each element of the deformable mirror means is automatically adjusted to maintain a practically zero phase difference between the sample beam and the reference beam.

4,682,026

METHOD AND APPARATUS HAVING RF BIASING FOR SAMPLING A PLASMA INTO A VACUUM CHAMBER

Donald J. Douglas, Toronto, Canada, assignor to MDS Health Group Limited, Rexdale, Canada

Filed Apr. 10, 1986, Ser. No. 850,188
Int. Cl.[4] H01J *49/10*
U.S. Cl. 250—288 **19 Claims**



1. Apparatus for sampling ions in a plasma into a vacuum chamber comprising:

(a) means for generating a plasma, including (i) an electrical induction coil having first and second terminals and at least one turn between said first and second terminals, said turn defining a space within said coil for generation of said plasma, and (ii) generating means for generating a first RF voltage to apply to said coil to provide heating within said space to generate said plasma,

(b) a vacuum chamber including an orifice plate defining a wall of said vacuum chamber.

(c) said orifice plate having an orifice therein located adjacent said space for sampling a portion of said plasma through said orifice into said vacuum chamber,

(d) second generating means for generating a second RF voltage of frequency the same as that of said first RF voltage and phase locked to said first RF voltage,

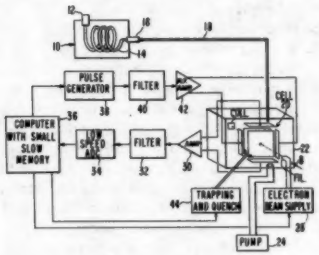
(e) and means connected between said orifice plate and said second generating means for biasing said orifice plate with said second RF voltage to increase the flow of said ions through said orifice.

4,682,027

METHOD AND APPARATUS FOR SAMPLE CONFIRMATION IN GAS CHROMATOGRAPHY

Gregory J. Wells, Suisun, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 25, 1986, Ser. No. 856,721
Int. Cl.[4] H01J *49/38*
U.S. Cl. 250—291 **6 Claims**



1. Apparatus for analysis of a vapor sample comprising:

a pulsed ion-cyclotron resonance device including:

(a) a sample cell,

(b) means for ionizing a portion of said vapor sample within said sample cell,

(c) magnet means for creating a substantially uniform magnetic field within said sample cell,

(d) means for exciting said ions with a pulsed, wide-band rf field orthogonal to said magnetic field,

(e) means for detecting the cyclotron resonance of the excited ions and for generating a signal in the time domain,

(f) means for digitizing said time domain signal, and

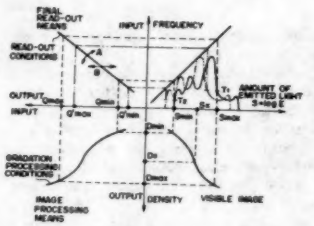
(g) means for directly comparing said digitized time domain signal with at least one reference time domain signal and quantifying the degree of correlation of said sample and reference signals.

4,682,028

METHOD OF ADJUSTING RADIATION IMAGE READ-OUT CONDITIONS

Hirosi Tanaka, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1985, Ser. No. 695,332
Claims priority, application Japan, Jan. 26, 1984, 59-12658
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **6 Claims**



1. A method of adjusting radiation image read-out conditions used in a radiation image recording and reproducing system wherein preliminary read-out conducted by scanning a stimulable phosphor sheet carrying a radiation image of an object stored therein by stimulating rays of a level lower than the level of the stimulating rays used in final read-out and approximately detecting the image information stored in the stimulable phosphor sheet is carried out prior to the final read-out for scanning the stimulable phosphor sheet by the stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the radiation energy stored and detecting the emitted light by a photoelectric read-out means to obtain an image signal, read-out conditions for the final read-out are adjusted on the basis of the information obtained by the preliminary read-out, the final read-out is conducted by use of the read-out conditions, the image signal obtained by the final read-out is sent to an image processing means, and a visible image is reproduced by use of the image signal processed by the image processing means,

the method of adjusting radiation image read-out conditions comprises the steps of:

(i) determining a histogram of the amount of the light emitted by said stimulable phosphor sheet during said preliminary read-out,

(ii) associating range portions of said histogram with portions of said object;

(iii) selecting for the final read-out one or more portions of said object associated with contiguous range portions of said histograms, said contiguous range portions being less than the total range of said histogram and being a desired image information range;

(iv) from said histogram, calculating the maximum light emission amount Smax and the minimum light emission

amount Smin of said contiguous range portions in said histogram, and

(v) adjusting said read-out conditions so that said maximum light emission amount Smax and said minimum light emission amount Smin correspond respectively to the maximum signal level Qmax and the minimum signal level Qmin of a desired input signal range in said image processing means which are determined by the maximum density Dmax and the minimum density Dmin of a correct density range in said reproduced visible image.

4,682,029

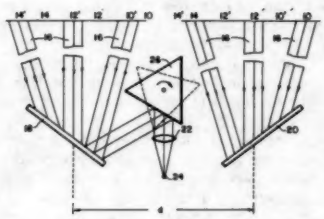
STEREOSCOPIC INFRARED IMAGER HAVING A TIME-SHARED DETECTOR ARRAY

Neal Diepeveen, Fair Lawn, and Robert E. Bastian, Wyckoff, both of N.J., assignors to Magnavox Government and Industrial Electronics Company, New York, N.Y.

Filed Oct. 22, 1985, Ser. No. 790,276

Int. Cl.⁴ G01J *5/08*

U.S. Cl. 250—330 **16 Claims**



1. A device for producing a stereoscopic visible image of an invisible radiation scene, said device comprising:

means for producing a first invisible image of the scene viewed from a first viewing position;

means for producing a second invisible radiation image of the scene viewed from a second viewing position spaced from the first viewing position;

a radiation detector for detecting the invisible radiation images;

means for alternately scanning the first and second invisible radiation images across the detector, each scan having a starting time and a scan rate;

a light source;

means for driving the light source to produce visible light having an intensity proportional to the intensity of the invisible radiation incident on the detector;

means for producing a first visible image of the light source in a first field of view at a third viewing position;

means for producing a second visible image of the light source in a second field of view at a fourth viewing position spaced from the third viewing position;

means for alternately scanning the first visible image across the first field of view and the second visible image across the second field of view, each scan having a starting time and a scan rate; and

means for synchronizing the starting time and scan rate of the visible scanning means with the starting time and scan rate of the invisible radiation scanning means.

4,682,030

INFRARED RADIATION DETECTOR WITH INTEGRAL FRESNEL LENS WINDOW

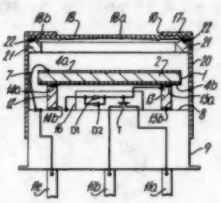
Michael A. Rose, Winchester, and Martin Rennis, Swindon, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1985, Ser. No. 767,317

Claims priority, application United Kingdom, Aug. 24, 1984, 8421507

Int. Cl.⁴ G01J *5/08*

U.S. Cl. 250—338 **14 Claims**



1. An infrared radiation detector comprising:

a hermetically sealed housing; and

a pyroelectric detector element arranged in the hermetically sealed housing;

characterized in that the hermetically sealed housing comprises:

a canister having an aperture therein; and

a Fresnel lens arranged in the hermetically sealed housing over the aperture to condense radiation onto the detector element.

4,682,031

INFRARED GAS ANALYZER

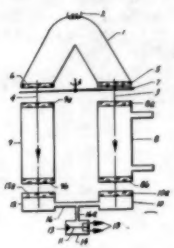
Walter Fabinski, Kriftel, and Werner Schaefer, Kronberg, both of Fed. Rep. of Germany, assignors to Hartmann & Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 856,585

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515128

Int. Cl.⁴ G01N *21/37*

U.S. Cl. 250—345 **3 Claims**



1. Infrared gas analyzer including a source of infrared radiation, a measuring chamber receiving and being passed through a first beam of infrared radiation from said source; a reference chamber disposed for receiving a second beam from said source; a first and second receiving chamber respecitvely disposed on radiation exit sides of said measuring and reference chambers and filled with a particular gas, the improvement comprising:

a pressure communicating duct system including a particular chamber connected to said two receiving chambers; and

a foil of polyvinylidenefluoride being piezo electrically effective and being disposed and tensioned across said particular chamber to partition said particular chamber

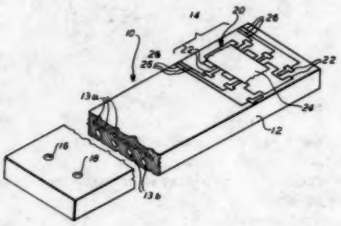
such that the pressure from the two receiving chambers act on said foil, there being means for attracting an electrical signal from oposite surfaces of said foil.

4,682,032

JOULE-THOMSON CRYOSTAT HAVING A CHEMICALLY-DEPOSITED INFRARED DETECTOR AND METHOD OF MANUFACTURE

John R. Barrett, Wayland, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 17, 1986, Ser. No. 819,576
Int. Cl.[4] G01J *5/04;* H01L *23/34*
U.S. Cl. 250—352 17 Claims



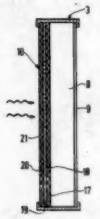
1. In combination with a Joule-Thomson cryostat having an elongated substrate with gas-carrying channels formed therein, an infrared detector chemically deposited directly on said substrate, such that said infrared detector is cooled by a gas flowing through the channels of said substrate.

4,682,033

CAMERA FOR DETECTING X AND γ RAYS, WHOSE SCINTILLATION BLOCK HAS AN ENTRANCE WINDOW CONSTITUTED BY A MECHANICALLY STIFF AND LOW ABSORBING X AND γ RADIATION SUPPORT

Guy N. Martin, Noiseau, and Michel R. Jatteau, Lesigny, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,620
Claims priority, application France, Jul. 6, 1984, 84 10786
Int. Cl.[4] G01T *1/164*
U.S. Cl. 250—363 R 8 Claims



1. A scintillation camera comprising a scintillation block including a scintillation crystal, an entrance window and an optical exit window; light intensifying means for receiving signals from said scintillator block; and signal measuring and displaying means for providing measured signals

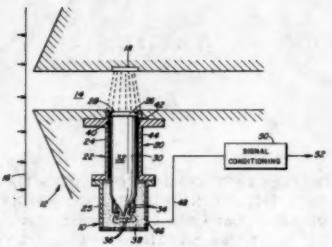
the improvement comprising said entrance window of said scintillation block being a mechanically stiffened supporting structure having a low absorption for ionizing radiation, wherein said mechanically stiffened supporting structure includes a honeycomb structure attached to at least one sheet, said honeycomb structure being provided perpendicular to a face of said sheet.

4,682,034

BLAST WAVE DENSITOMETER SYSTEM

David H. Saint, Medicine Hat, and John W. Funk, Vancouver, both of Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed May 6, 1985, Ser. No. 731,050
Int. Cl.[4] G01N *23/08*
U.S. Cl. 250—363 R 10 Claims



1. A densitometer comprising:

a source of beta radiation

a detector including

(a) a housing spaced from the source of beta radiation;

(b) a scintillator mounted in the housing to receive radiation from the beta radiation source;

(c) an abrasion resistant light seal over the scintillator for preventing ambient light from entering the scintillator while passing beta radiation from the source to the scintillator;

(d) a photomultiplier tube in the housing to receive light emitted by the scintillator, the photomultiplier tube having a glass envelope and electrical connection pins secured directly to the envelope at a base end thereof;

(e) a dynode divider chain mounted directly on the pins of the photomultiplier tube;

(f) an elastomeric potting compound, opaque to ambient light, securing the base end of the photomultiplier tube envelope, the electrical connection pins and the dynode divider chain within and out of contact with the housing; and

(g) an O-ring around the photomultiplier tube envelope, centering the tube in the housing.

4,682,035

SOLID STATE COUNTING SYSTEM FOR HIGH ENERGY BETA AND GAMMA DECAY ISOTOPES

Seth D. Shulman, Washington, D.C., assignor to Bioscan, Inc., Washington, D.C.

Filed Apr. 23, 1985, Ser. No. 726,247
Int. Cl.[4] G01T *1/24*
U.S. Cl. 250—370 46 Claims

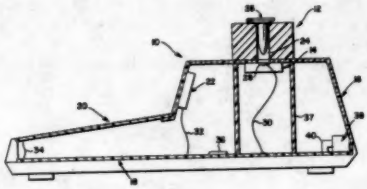
1. A portable, bench top radiation detection apparatus for quantitative analysis of radioactive samples comprising:

a sample holder having an opening defining an interior sample receiving zone for receiving a container containing a single radiation-emitting sample;

a generally planar, solid state radiation detector positioned adjacent said sample holder at one end of the sample receiving zone for detecting radiation emitted by said radiation-emitting sample;

signal analyzing means responsive to said radiation detector for quantitatively analyzing radiation emitted by said radiation-emitting sample, said signal analyzing means including means for storing a value related to a pre-

selected radiation emissing characteristic of a known radiation-emitting sample positioned in said sample receiving zone, and means responsive to said stored value for



analyzing radiation emissions from a different sample placed in said sample receiving zone; and

means for displaying a radiation emission characteristic for said different radiation-emitting sample.

4,682,036

GAMMA RAY COMPENSATION-TYPE NEUTRON IONIZATION CHAMBER

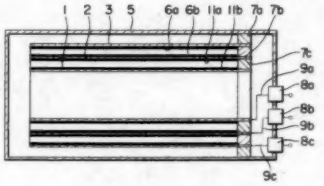
Naoaki Wakayama; Hideshi Yamagishi, both of Ibaraki; Shinji Fukakusa, and Toshimasa Tomoda, both of Amagasaki, all of Japan, assignors to Japan Atomic Energy Research Institute and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

Filed Jan. 23, 1985, Ser. No. 693,889

Claims priority, application Japan, Jan. 23, 1984, 59-9721

Int. Cl.[4] G01T *1/185, 3/00*

U.S. Cl. 250—374 **6 Claims**



1. A neutron ionization chamber of the gamma ray compensation type comprising:

a neutron sensing ionization chamber portion having an electrode surface coated with a neutron-sensing material;

a gamma ray sensing ionization chamber portion which has a low neutron sensitivity in comparison with the neutron sensitivity of said neutron-sensing material;

means for subtracting ionization currents in the gamma ray sensing ionization chamber portion from ionization currents in the neutron sensing ionization chamber portion; and

a coating material which is coated on an electrode surface of the gamma ray sensing ionization chamber portion, said coating material including a material for sensing neutrons the percentage of which is less than the percentage of said neutron-sensing material of the neutron sensing ionization chamber portion.

4,682,037

PROJECTION EXPOSURE APPARATUS HAVING AN ALIGNMENT LIGHT OF A WAVELENGTH OTHER THAN THAT OF THE EXPOSURE LIGHT

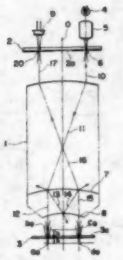
Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,258

Claims priority, application Japan, Jul. 10, 1984, 59-143465; Aug. 15, 1984, 59-169205

Int. Cl.[4] G01B *11/00;* **G01J** *1/20*

U.S. Cl. 250—548 **13 Claims**



1. An apparatus for exposing, with light of a first wavelength, a second member to a pattern of a first member, so as to transfer the pattern of the first member onto the second member, said apparatus comprising:

means for irradiating the first member with the light of the first wavelength;

means for producing light of a second wavelength different from the first wavelength;

projecting means for optically projecting, onto the second member, an image of the pattern of the first member irradiated with the light of the first wavelength from said irradiating means, said projecting means having an optical characteristic in which aberration is corrected with respect to the light of the first wavelength, said projecting means having a refracting surface for refracting the light of the first wavelength, and said refracting surface having a predetermined reflection factor with respect to the light of the second wavelength; and

adjusting means effective to bring the second member and the projected image of the pattern of said first member into a predetermined positional relation, the positional relation being determined using the light of the second wavelength having been reflected by said refracting surface of said projecting means.

4,682,038

ARRANGEMENT FOR MONITORING AND CONTROLLING WEBS IN PACKAGING MACHINES

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,843

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341539

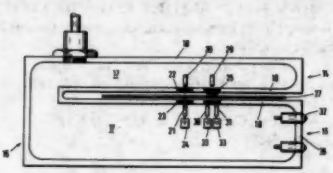
Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—548 **7 Claims**

1. In a packaging machine for packaging objects with a web which is passed along a path through said packaging machine, said web being divided into a plurality of blanks, said web further having an elongate tear-open strip running along the length of said web and along the path through which said web passes, a device for monitoring conditions of said web, said device comprising:

a first set of sensors for sensing a first set of characteristics of said web, said first of characteristics including material defects, and for accordingly providing a signal indicative of a material defect; and

a second set of sensors for sensing a second set of characteristics of said web, different from said first set of characteristics, said second set of characteristics including positional orientation of said web with respect to said packaging machine, and for accordingly providing a signal indicative of mispositioning.



4,682,039

PHOTOELECTRIC TAPE PROFILE DETECTOR FOR FILE SECURITY

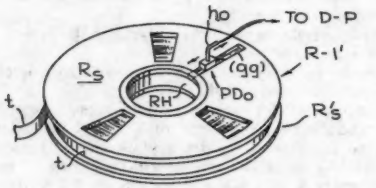
Herbert U. Ragle, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 24, 1982, Ser. No. 351,952

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **19 Claims**



1. A method of photo-electrically developing a wrapping profile, or winding signature, for a tape web segment adapted to be wrapped upon a prescribed reel, this method being adapted to enhance computer tape file security so that each time such a web is wound upon a reel, the winding mode, after repeated windings, is assumed to leave the array of wrapped web edges in a unique edge wrap profile represented by the position of each winding edge as sighted radially along one side of the reel, such a profile constituting the "winding signature", this method involving:

providing photo-electric means for automatically monitoring the relative positions of these web-edges and so detecting this "winding-signature", and also for electronically representing and storing these position values as a prescribed encoded signature representation each time the web is wound; this means being adapted to automatically make such "signature" representation available for use in monitoring unspooling and respooling operations.

4,682,040

IMAGE PICKUP APPARATUS FOR A PRINTED WIRING BOARD

Tetsuo Hohki; Tetsuo Sano, both of Kyoto; Eiji Kodama, Higashi-Osaka, and Hisayuki Tsujinaka, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 6, 1985, Ser. No. 730,797

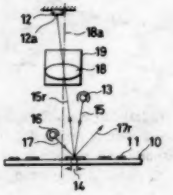
Claims priority, application Japan, Jun. 2, 1984, 59-113628

Int. Cl.[4] G01N *21/47, 21/55, 21/89*

U.S. Cl. 250—571 **12 Claims**

1. An image pickup apparatus for a printed wirng board comprising illumination source means for supplying constant irradiation light on the surface of a printed wiring board provided with copper patterns and a solid state image sensor for receiving light reflected by said surface of said printed wiring board through a lens thereby to output image pickup signals,

said solid state image sensor comprising a one-dimensional CCD image sensor extending over said printed wiring board and having a light receiving surface set parallel to the surface of said board and opposed to said surface of said printed wiring board, said illumination source means



being formed by a main illumination source arranged to reflect light specularly on said surface of said printed wiring board with respect to said light receiving surface of said solid state image sensor and a subsidiary illumination source arranged to reflect light diffusely on said surface of said printed wiring board with respect to said light receiving surface of said solid state image sensor thereby to supply said light receiving surface with scattering light diffusedly reflected by the surface of said copper patterns.

4,682,041

COATING QUALITY MEASURING DEVICE AND METHOD

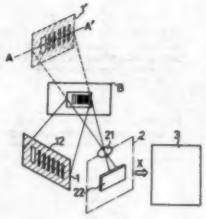
Tsuneyuki Egami, Gamagori; Tsutomu Saito, Okazaki; Mitosi Ando, Nishio; Ryuzou Hori, Toyota; Takashi Kamo, Toyota, and Kazunori Yoshida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 19, 1985, Ser. No. 777,682

Claims priority, application Japan, Sep. 20, 1984, 59-197705

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—571 **20 Claims**



1. A coating quality measuring device for measuring the coating quality of a coated surface, comprising:

a pattern plate positioned opposite the coated surface to be measured, said pattern plate being provided with a plurality of strip pattern portions arranged at intervals on a surface of said pattern plate opposite the coated surface, each of said strip pattern portions having a constant width and transmitting light differently than a ground portion of said pattern plate, said pattern plate including a reference pattern portion having a width greater than said constant width, said reference pattern portion width being large enough that a level of light of an image of said reference pattern portion reflected from said coated surface remains substantially invariant to changes in coating quality;

image-pickup means for forming an image of said pattern

plate reflected off said coated surface, and for scanning the formed reflected image along a line extending in a width direction of each pattern portion, and for successively generating output signals having signal levels which vary corresponding to a light level of the reflected image of each said pattern portion and said ground portion along the scanned line; and

computing means for computing the coating quality of the coated surface by processing the signal levels of successively generated output signals.

4,682,042

INFORMATION READING DEVICE WITH DRIVER CIRCUITRY SEPARATE FROM SENSOR BOARD

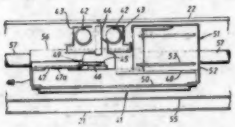
Yosuke Igarashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 18, 1985, Ser. No. 788,836

Claims priority, application Japan, Oct. 30, 1984, 59-228505

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **21 Claims**



1. An information reading device for reading information from an original document, said device comprising:

a main body member having an inner bottom surface;

an original table member mounted on said main body member and having a surface spaced from and substantially parallel to said inner bottom surface to support an original document to be scanned;

a carriage member mounted on said main body member and movable reciprocally in a plane substantially parallel to said original table member surface;

carriage driving means for reciprocally moving said carriage member;

a scanner mounted on said carriage member, said scanner including,

a light source disposed to irradiate light onto the original document positioned on said table member surface during reciprocal movement of said carriage member, and

light leading means positioned to guide said irradiated light reflected from the original document to a selected location;

a sensor board having image sensing means on one surface thereof, said sensor board being mounted on said carriage member and disposed to position said image sensing means at said selected location for receiving said irradiated reflected light from said light leading means and for converting said irradiated reflected light into electrical signals;

a driver board mounted on said carriage member adjacent to but spaced from said sensor board, said driver board having driving circuitry for driving said image sensing means incorporated into one surface of said driver board; and

means for electrically connecting said image sensing means and said driving circuitry.

4,682,043

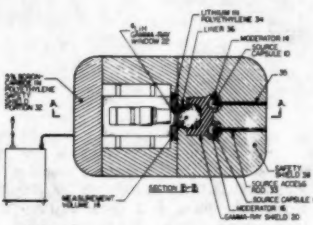
OBTAINING UNIFORMITY OF RESPONSE IN ANALYTICAL MEASUREMENT IN A NEUTRON-CAPTURE-BASED ON-LINE BULK-SUBSTANCE ELEMENTAL-ANALYZER APPARATUS

J. Howard Marshall, 145 Hurlbut, Apt. 305, Pasadena, Calif. 91105

Continuation of Ser. No. 866,488, Jan. 3, 1978. This application Jul. 30, 1979, Ser. No. 61,833

Int. Cl.⁴ G01F *23/00*

U.S. Cl. 250—358.1 **8 Claims**



1. An improved apparatus for the on-line analysis of the composition of a bulk substance in a measurement volume, wherein said analysis includes the production and capture of neutrons and the detection of the resulting capture gamma rays, said apparatus comprising, in combination:

(a) means for containing the bulk substance to be analyzed, said means comprising a bulk substance receiving passageway substantially square in cross-section having first, second, third and fourth interconnected sides said means for containing the bulk substance being at least partly surrounded by a neutron-reflecting substance;

(b) neutron-producing means for providing neutrons which generate gamma rays by neutron-capture reactions with the nuclei in the bulk substance being analyzed, the neutron-producing means being operably associated with the means for containing the bulk substance; and

(c) means for gamma-ray detection operably associated with the neutron-producing means and the means for containing the bulk substance being analyzed, the means for gammaray detection producing electrical signals indicative of the gamma-ray energies to provide for the measurement of the energy spectrum of the capture gamma rays.

4,682,044

ENGINE IDLING LOAD CONTROL MEANS

Makoto Hotate; Tadashi Kaneko; Toshio Nishikawa, all of Hiroshima; Tadataka Nakazumi, Kure, and Nobuo Takeuchi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 25, 1985, Ser. No. 791,447

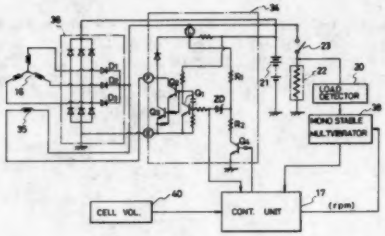
Claims priority, application Japan, Oct. 25, 1984, 59-225378; Oct. 25, 1984, 59-225379

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 290—40 **9 Claims**

1. A power plant including an engine, electric generator means driven by said engine to produce an electric output which is adapted to be supplied to an electric load, electric cell means connected with said load such that an electric power is supplied from said generator means to said electric load when the generator means provides an output voltage higher than a voltage of the electric cell means but from said electric cell means when the voltage of said generator means is lower than the voltage of the electric cell means, load detecting means for detecting an instance wherein the electric load is turned on, engine control means for increasing engine output when said

engine is being operated in an idling condition and subjected to said electric load, generator output regulating means for regulating the electric output voltage of said generator means in accordance with an electric current to said electric load so that a field current of said generator means is increased as the electric output voltage of the generator means increases, generator control means responsive to a signal from said load detecting means showing that the electric load has just been turned on for controlling said generator electric output voltage regulating means to suppress an increase of the field current and thereby suppress an increase of the electric output voltage of the electric generator means for a predetermined time so as to prevent an abrupt decrease in speed of the engine.

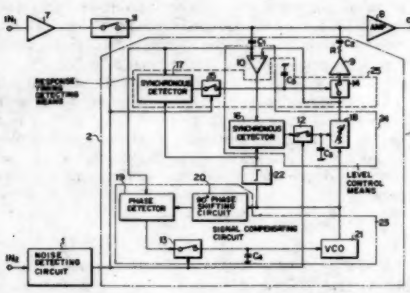


4,682,045

NOISE ELIMINATING SIGNAL COMPENSATION CIRCUIT

Kiyoshi Amazawa, and Akira Mori, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,828
Claims priority, application Japan, Feb. 12, 1985, 60-25440
Int. Cl.[4] H04H *5/00*
U.S. Cl. 307—125 **5 Claims**



1. A noise eliminating signal compensation circuit, comprising:

input terminal means and output terminal means;

switch means having an input coupled to said input terminal means and adapted to be turned on and off for respectively passing and blocking an input signal present at said input terminal means, said switch means having an output which is coupled to said output terminal means;

noise detecting means coupled to said input terminal means for detecting a noise component intermittently present at said input terminal means and for respectively turning said switch means off and on in response to the presence and absence of said noise component; and

signal compensation circuit means having an input coupled through a coupling capacitor to said output of said switch means for generating a compensation signal in response to said input signal, wherein said signal compensation circuit means includes signal generating means responsive to said input signal when said switch means is turned on for generating a frequency signal having a frequency equal to that of said input signal, includes level control means responsive to said input signal and said frequency signal for adjusting a level of said frequency signal to a level substantially equal to that of said input signal, said adjusted signal being said compensation signal, and includes response timing detecting means for detecting a response timing of said signal generating means and level control means relative to said input signal and for supplying said compensation signal from said level control means to holding means upon detection of the response timing, said holding means facilitating application of said compensation signal to said output terminal means when said switch means is turned off;

wherein said coupling capacitor connected between said switch means and said signal compensation circuit means passes only high frequency signal components, and wherein said response timing detecting means includes a first switch which is connected between said level control means and said holding means and which is turned on by said response timing detecting means upon detection of the response timing.

4,682,046

POSITIVE OR NEGATIVE VOLTAGE POWER SUPPLY WITH SLIDEABLE CARRIER SWITCHING MECHANISM

David H. Buerkel, Wayne, Pa., assignor to Applied Energy Systems, Inc., Malvern, Pa.

Filed Aug. 1, 1986, Ser. No. 892,670
Int. Cl.[4] H02J *1/00*
U.S. Cl. 307—138 **9 Claims**

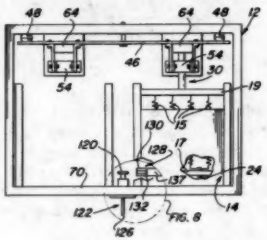
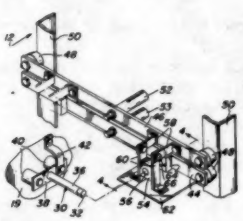


FIG. 8



1. An electrical apparatus for selectively providing voltages of different polarities including:

(a) a support;

(b) a carrier slidably mounted on the support for movement between first and second positions, said carrier including electrical circuitry therein;

(c) a positive source of power and a negative source of power; and

(d) conductor means on the carrier for connecting the positive source of power to said circuitry when the carrier is in the first position and for connecting the negative source

of power to the circuitry when the carrier is in said second position.

4,682,047

COMPLEMENTARY METAL-OXIDE-SEMICONDUCTOR INPUT CIRCUIT

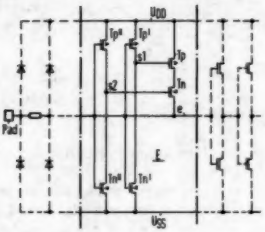
Frithjof von Sichart, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 898,144

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530917

Int. Cl.⁴ H03K *17/08, 19/003, 19/094, 17/687*

U.S. Cl. 307—200 B **4 Claims**



1. In a complementary metal-oxide-semiconductor circuit of the type which includes a circuit input, complementary metal-oxide-semiconductor transistors each having a threshold voltage, and an operating voltage source, the improvement of an input circuit comprising a switched resistor which is controlled from the input to define the potential at the input terminal when the same is not connected, said improvement comprising:

a metal-oxide-semiconductor transistor circuit including first and second serially connected transistors connected between the circuit input and the operating voltage source, said first transistor having a gate and a first threshold voltage near the threshold voltage of one of the channel types, said second transistor having a gate and a second threshold voltage near the threshold voltage of the other channel type, said first and second threshold voltages lying in a region between the threshold voltages of the complementary metal-oxide-semiconductor transistors; and

control means connected between the input and said gates and responsive to the potential at the input to operate said first and second transistors to states of conductivity which cause a potential to be defined at the input.

4,682,048

OUTPUT CIRCUIT WITH IMPROVED TIMING CONTROL CIRCUIT

Shoji Ishimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,454

Claims priority, application Japan, Nov. 21, 1983, 58-219016

Int. Cl.⁴ H03K *5/13, 5/159, 17/28;* **G11C** *8/00*

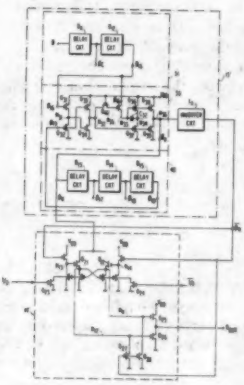
U.S. Cl. 307—269 **9 Claims**

1. An output circuit comprising:

a driver circuit having a first control terminal, a second control terminal and an output terminal, said driver circuit operatively generating a first timing signal at said output terminal during a period from a time when a first control signal is applied to said first control terminal under absence of application of a second control signal to said second control terminal to a time when said second control signal is applied to said second control terminal,

a delay circuit having an input terminal coupled to said output terminal of said driver circuit and an output terminal coupled to said second control terminal of said driver circuit, said delay circuit generating said second control signal at the output terminal thereof when a predetermined time period has elapsed from the generation of said first timing signal, and

an output section having an operation control terminal coupled to said output terminal of said driver circuit, a data



input terminal receiving an input data signal and a data output terminal, said output section operatively generating at said data output terminal an output data signal corresponding to an input data signal applied to said data input terminal when said first timing signal is present, whereby said output data signal is generated during said predetermined period.

4,682,049

PULSE SHAPER FOR INDUCTIVE TRANSMITTERS

Michael Kirschner, Pforzheim; Günter Rapp, Hemmingen, and Martin Zechnall, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

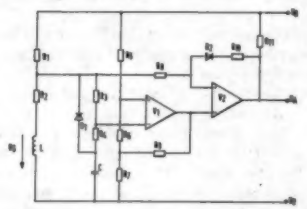
PCT No. PCT/DE85/00310, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/01860, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 9, 1985, Ser. No. 857,748

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3433777

Int. Cl.⁴ H03K *5/08*

U.S. Cl. 307—268 **4 Claims**



1. A pulse shaper for inductive transmitters, in particular inductive crankshaft angle transmitters on internal combustion engines, comprising a Schmitt trigger which includes a first and a second differential amplifier each having two inputs; first setting means connected to one input of the first amplifier to

apply thereto a substantially fixed potential during an equilibrium condition of the Schmitt trigger; a peak value detector for coupling via said first setting means an inductive transmitter to the one input of the first amplifier, said detector including a detecting diode and a capacity for storing a detected peak value signal; second setting means connected to the other input of the first amplifier to set a fixed trigger threshold; the output of the first amplifier being connected to one input of the second amplifier and the other input of the second amplifier being connected to said inductive transmitter; a feedback diode connected between the output and the other input of the second amplifier, the feedback diode being in blocking condition when the second amplifier is switched off; and feedback means connected between the output of the first amplifier and the second setting means to adjust another trigger threshold whose value depends on a previously detected peak value signal stored in said capacity.

4,682,050

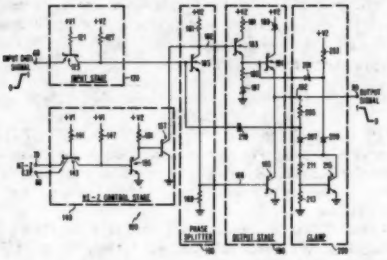
SMALL SIGNAL SWING DRIVER CIRCUIT

Herve L. Beranger, Fontainebleau, France; Gene J. Gaudenzi, Purdys; Dennis C. Reedy, Stormville, both of N.Y., and Helmut Schettler, Dettenhausen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1986, Ser. No. 817,143

Int. Cl.[4] **H03K** *3/01, 19/088;* **H01L** *9/02;* **H03B** *1/04*

U.S. Cl. 307—270 **10 Claims**



4. A driver for applying a digital output signal to an interconnect line, the driver comprising:

an input circuit, responsive to a digital data input signal applied to a data input of the driver, the input circuit comprising at least one serially connected intermediate circuit, each intermediate circuit producing a corresponding intermediate signal;

an output circuit, responsive to at least one of the intermediate signals, for producing the digital output dignal; and

a clamp and output transition control circuit, connected between the output of the driver and an input of at least one of the intermediate circuits, for sinking current from the output of the driver whenever the voltage at the output of the driver exceeds a pre-selected threshold value and for controlling a falling transition time in the digital output signal produced by the driver, which comprises:

(a) sinking means, connected to the output of the driver, for sinking current whenever the voltage at the output of the driver exceeds the value of the threshold voltage; and

(b) a capacitor, connected at a first end to the input of at least one of the intermediate circuits and connected at a second end to said sinking means, for controlling the falling transition time.

4,682,051

VOLTAGE LEVEL DETECTION CIRCUIT

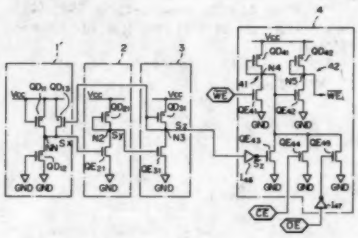
Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 27, 1985, Ser. No. 706,284

Claims priority, application Japan, Feb. 28, 1984, 59-35112

Int. Cl.[4] **H03K** *17/30*

U.S. Cl. 307—359 **12 Claims**



1. A voltage level detection circuit connected between first and second feed lines, comprising:

a first depletion-type metal insulator semiconductor (MIS) transistor, connected between said first feed line and a common node, having a gate connected to said first feed line, having a source and having a drain, the source and drain forming source-drain current path between said common node and said first feed line;

a second depletion-type MIS transistor, connected between said common node and said second feed line, having a gate connected to said second feed line, having a source and having a drain, the source and drain forming a source-drain current path between said common node and said second feed line;

output signal generation means, connected to said common node, for generating at an output terminal thereof an output signal when the potential at said common node reaches a predetermiend value, said output signal generation means including:

a first inverter circuit having an input terminal connected to said common node and having an output terminal; and

a second inverter circuit having an input terminal connected to said output terminal of said first inverter circuit; and

a third depletion-type MIS transistor having a drain connected to the drain of said first depletion-type MIS transistor, having a source connected to the source of said first depletion-type MIS transistor, and having a gate connected to said output terminal of said output signal generation means, for stabilizing said output signal at said output terminal of said output signal generation means.

4,682,052

INPUT BUFFER CIRCUIT

Mikio Kyomasu, Hamamatsu, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 693,017

Claims priority, application Japan, Jan. 20, 1984, 59-9064

Int. Cl.[4] **H03K** *17/30, 17/693*

U.S. Cl. 307—361 **5 Claims**

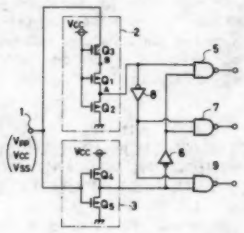
1. Circuitry comprising:

input means for receiving an input signal capable of taking any one of first, second and third levels;

first detecting means connected to said input means and having a first threshold level which is lower than said first level but higher than said second level for outputting a first result of comparison between said input signal and said first threshold level, wherein said first detecting means includes a CMOS inverter and a depletion type

MOS transistor connected in series with said CMOS inverter having a source/drain connected to a first reference potential, said depletion type MOS transistor having a source/drain connected to said input means;

second detecting means connected to said input means and having a second threshold level which is lower than said second level but higher than said third level for outputting



a second result of comparison between said input means and said second threshold level; and

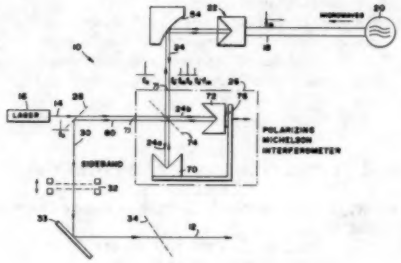
third detecting means connected to said first and second detecting means for determining the level of said input signal applied to said input signal in accordance with said first and second results and for outputting a signal which is a function of the level of the input signal applied to the input means.

4,682,053

METHOD AND MEANS FOR GENERATION OF TUNABLE LASER SIDEBANDS IN THE FAR-INFRARED REGION

Herbert M. Pickett, La Canada, and Jam Farhoomand, Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,887
Int. Cl.⁴ G02F *2/00*; H01S *3/00*
U.S. Cl. 307—425 **7 Claims**



1. Apparatus for generating tunable electromagnetic radiation of a far-infrared wavelength comprising:

means for generating infrared radiation of a predetermined first frequency;

means for generating microwave radiation of a microwave frequency, said generating means being capable of continuously varying the frequency of the microwave radiation, at least within a predetermined range;

means for mixing said infrared and microwave radiation to generate mixed radiation containing first infrared radiation of said first infrared frequency and second infrared radiation of a second infrared frequency representing a first sideband frequency which differs from said first frequency by said microwave frequency;

means for separating radiation of said second infrared frequency from said mixed radiation;

said separating means comprising a polarizing Michelson interferometer which includes first and second rooftop reflectors and a first polarizer, all arranged so said mixed radiation encounters said first polarizer, with one part of the mixed radiation passing through said first polarizer to said first reflector and back to the first polarizer, and another part of the mixed radiation reflecting off said first polarizer to said second reflector and back to the first polarizer, said separating means also including a second polarizer positioned to receive at least a portion of the first radiation part from the first polarizer after the first radiation part reflects from the first reflector to the first polarizer, and to also receive at least a portion of the second radiation part from the first polarizer after the second radiation part has reflected from the second reflector;

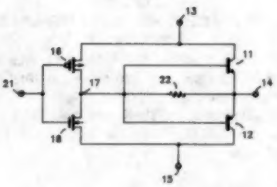
said first and second reflectors located at different distances from the first polarizer, the difference in distance equal to an integral number of wavelengths of one infrared frequency of the mixed radiation and also equal to an integral number plus one-half times the wavelength of another infrared frequency of said mixed radiation, whereby to differently polarize the different infrared frequencies to allow the second polarizer to pass one infrared frequency and reflect the other.

4,682,054

BICMOS DRIVER WITH OUTPUT VOLTAGE SWING ENHANCEMENT

Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1986, Ser. No. 879,750
Int. Cl.⁴ H03K *19/01*
U.S. Cl. 307—446 **4 Claims**



1. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

an input terminal;

an output terminal;

a first bipolar transistor coupled between said first supply voltage terminal and said output terminal and having a base coupled to a node;

a second bipolar transistor coupled between said output terminal and said second supply voltage terminal and having a base coupled to said node;

first means coupled between said first supply voltage terminal and said node and coupled to said input terminal for providing a voltage for biasing said first transistor, said first means providing a high impedance to said input terminal;

second means coupled between said node and said second supply voltage terminal and coupled to said input terminal for biasing said second transistor, aaid second means providing a high impedance to said input terminal; and

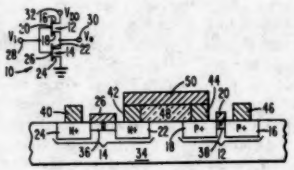
a resistor coupled between said node and said output terminal.

4,682,055

CFET INVERTER HAVING EQUAL OUTPUT SIGNAL RISE AND FALL TIMES BY ADJUSTMENT OF THE PULL-UP AND PULL-DOWN TRANSCONDUCTANCES

Lakshminarasimha C. Upadhyayula, East Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 17, 1986, Ser. No. 839,917
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—451 **5 Claims**



1. A logic circuit comprising:

input, output, and a pair of power supply terminals having a potential difference therebetween of between about 0.5 and 1 volt;

a P-channel metal semiconductor field effect transistor having gate, source, and drain electrodes; and

an N-channel metal semiconductor field effect transistor having gate, source, and drain electrodes, the P-channel transistor drain electrode being coupled to the N-channel transistor drain electrode and to said output terminal, said gate electrodes being coupled together and to said input terminal, said source electrodes being respectively coupled to said power supply terminals; wherein

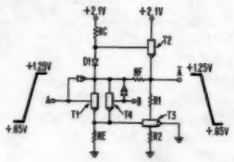
the length of said P-channel transistor channel region is between about 0.1 and 0.5 μm, to ensure substantially equal currents in said transistors when changing the logic state.

4,682,056

SWITCHING CIRCUIT HAVING LOW SPEED/POWER PRODUCT

Gene J. Gaudenzi, Purdys, and Dennis C. Reedy, Stormville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,949
Int. Cl.[4] H03K *19/01, 19/088, 17/04, 17/60*
U.S. Cl. 307—456 **8 Claims**



8. A logical binary circuit having a low speed/power product for driving a highly capacitive load, said logical binary circuit comprising:

at least one input terminal;

an output terminal;

first active circuit means for charging said highly capacitive load from a first potential to a second potential in response to a first binary input impressed on said at least one input terminal, where the absolute magnitude of said second potential is approximately twice the voltage magnitude of said first potential; and

second active circuit means interconnected with said first circuit means, said second circuit means discharging said highly capacitive load from said second potential to said first potential in response to a second logical binary input impressed on said at least one input terminal;

said first and second active circuit means interconnected between said at least one input terminal and said output terminal; and,

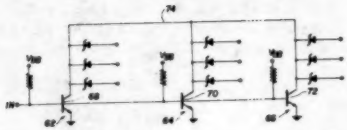
said logical binary circuit being further characterized in that a portion of said first active circuit means for charging said highly capacitive load is also employed in said second active circuit means for discharging said highly capacitive load and wherein said portion of said first active circuit means employed in both charging and discharging said highly capacitive load is at least one input transistor directly connected to said at least one input terminal.

4,682,057

CIRCUIT DESIGN TECHNIQUE TO PREVENT CURRENT HOGGING WHEN MINIMIZING INTERCONNECT STRIPES BY PARALLELING STL OR ISL GATE INPUTS

Brent R. Doyle, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 14, 1981, Ser. No. 301,761
Int. Cl.[4] H03K *19/091*
U.S. Cl. 307—459 **10 Claims**



1. A logic circuit, comprising:

a plurality of single-input, multiple-output logic gates each having a transistor including a base, emitter and collector, said single-input being applied to said base of said transistor, said multiple-outputs being taken from said collector of said transistor through Schottky diodes, said collector having an ohmic collector contact, said bases of said plurality of transistors being connected together and driven by a current source means, said emitters of said plurality of transistors being connected to a common potential node; and

contact means interconnecting said ohmic collector contacts of said plurality of gates for reducing current hogging between the bsaes of said transistors when said logic gates have unequal load currents drawn by said multiple outputs.

4,682,058

THREE-STATE LOGIC CIRCUIT FOR WIRE-ORING TO A DATA BUS

Laszlo V. Gal, Poway, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Jul. 3, 1986, Ser. No. 881,735
Int. Cl.[4] H03K *17/16*
U.S. Cl. 307—473 **6 Claims**

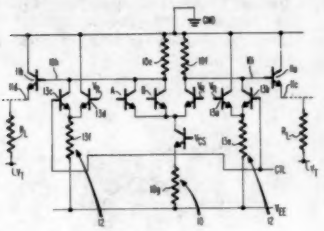
5. A three-state logic circuit comprising:

a conductor for carrying output signals of said circuit;

a logic gate having input terminals for receiving input logic signals and having a means for generating high and low output voltages V_H and V_L on said conductor as a logical function of said input logic signals; and

a control circuit, connected to said conductor in parallel with said logic gate, which responds to a control signal by lowering said voltages V_H and V_L on said conductor by an increment which is at least as large as $V_H - V_L$; said control circuit including a pair of transistors that respectively receive a reference voltage and a control signal on

their base, having collectors that respectively connect to said conductor and to a ground bus, and having emitters



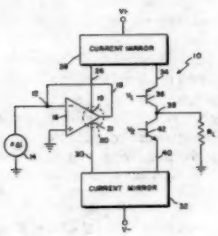
that are coupled together through a resistive means to a voltage bus.

4,682,059

COMPARATOR INPUT STAGE FOR INTERFACE WITH SIGNAL CURRENT

Carlos M. Garcia, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 31, 1985, Ser. No. 793,316
Int. Cl.[4] H03F *3/18*
U.S. Cl. 307—496 **31 Claims**



1. A current interface circuit, comprising:

an input mode for receiving an input current flow from a current source;

a circuit output;

an impedance buffering circuit connected to the input node and having means for maintaining a low impedance at the input node and having first and second current outputs and having first circuit means for producing a change in a current flow at said first current output and at said second current output in response to a change in magnitude of said input current flow; and

second circuit means, connected to said first and second current outputs and to said circuit output, for producing a change in current flow at the circuit output in response to said current flow changes at said first and second outputs;

wherein said second circuit means includes a first current mirror having a controlled leg connected to said first current output and a controllable leg connected to the circuit output, and a second current mirror having a controlled leg connected to said second current output and a controllable leg connected to the circuit output;

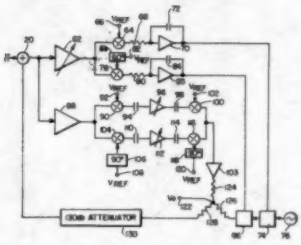
wherein said controllable legs are connected to the circuit by respective complementary conductivity transistor devices, each device having a first terminal connected to the controllable leg of the respective current mirrors, a second terminal connected to the circuit output, and a control terminal connected to a biasing voltage.

4,682,060

NOISE SUPPRESSION IN AN I-F SUBSTITUTION LOOP

Bengt A. Ulriksson, Gaithersburg, and Lawrence Fletcher, Frederick, both of Md., assignors to Weinschel Engineering Co., Inc., Gaithersburg, Md.

Filed Mar. 5, 1985, Ser. No. 708,494
Int. Cl.[4] H03B *3/04*; H04B *1/10*
U.S. Cl. 307—543 **6 Claims**



1. A noise reduction circuit for use with an I-F substitution loop comprising

an I-F substitution loop having a summing junction,

a source of I-F signals, having side band frequencies and an I-F frequency,

a source of a substitution signal,

means supplying both said signals to said summing junction,

amplification loop means for transforming and amplifying a signal at said summing junction and feeding back to the summing junction an amplified and transformed signal produced by said amplification loop means,

said amplification loop means including

first amplifier means for receiving as an input signal the signal at said summing junction, and providing a first DC output signal bandpass filtered to provide a pass band at the side band frequencies and a stop band at the I-F frequency,

second amplifier means connected in a quadrature with said first amplifier means for receiving as an input signal the signal at said summing junction, and providing a second DC output signal bandpass filtered to provide a pass band at the side band frequencies and a stop band at the I-F frequency,

means applying said first and second output signals to said summing junction,

third amplifier means for receiving as input signals and summing together said first and second output signals for providing at an output terminal a third output signal, and

means for connecting said third output signal to said summing junction.

4,682,061

MOSFET TRANSISTOR SWITCH CONTROL

William J. Donovan, San Bernandino, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 1, 1986, Ser. No. 858,154
Int. Cl.[4] H03K *17/687, 3/42, 3/26*; G02B *27/00*
U.S. Cl. 307—571 **11 Claims**

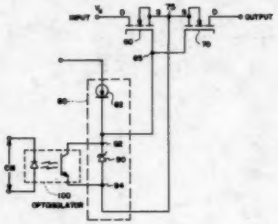
1. An isolated MOSFET switch control circuit having an input port and an output port comprising:

first and second switching MOSFETs for switching an input signal through the switch control circuit, the MOSFETs having their gates connected together at a gate junction, their sources connected together at a source junction, the drain of the first MOSFET connected to the input port and the drain of the second MOSFET connected to the output port;

current source means for generating a fixed enhancement voltage the current source means comprising a constant current diode having its anode connected to an external

voltage source, and a zener diode being connected at the cathode to the cathode of the constant current diode, a first switching means and the gate junction of the MOSFETs and being connected at the anode to a second switching terminal of the switching means and the source junction of the MOSFETs;

circuit control means for operating the switch control circuit; and



wherein said switching means for isolating the circuit control means from the switching MOSFETs and for applying and disconnecting the current source means to the switch control circuit such that, when the circuit control means turns the switching means off, the current source is applied and the switching MOSFETs will be turned on, a first switching terminal of and when the circuit control means turns the switching means off, the current source is disconnected and the switching MOSFETs will be turned off.

4,682,062

ANTI-THEFT SYSTEM FOR MOTOR VEHICLES

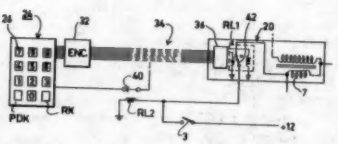
Zvi Weinberger, Ramot 03-345/43, Jerusalem, Israel

Filed Feb. 27, 1986, Ser. No. 833,288

Claims priority, application Israel, Feb. 27, 1985, 74461

Int. Cl.[4] B60R *25/00*

U.S. Cl. 307—10 AT **18 Claims**



1. An anti-theft system for motor vehicles, comprising:

a vehicle ignition switch for starting the vehicle when turned to an On-position and for terminating vehicle operation when turned to an Off-position;

a code input device for inputing a code;

a storage device for storing a predetermined code;

an electronic system including comparison means for comparing the inputted code with the stored code;

an enabling device actuated by said comparison means when the inputted code corresponds to the storage code;

said enabling device being effective, when actuated, to enable starting the vehicle engine by the vehicle ignition switch being turned to its On-position;

a manually operable reset device effective, when operated with the ignition switch in its Off-position, to deactuate said enabling device, but not effective when operated with the ignition switch in its On-position to deactuate the enabling device;

and a manually operable protection-disable device effective, when operated, to disable said reset device from deactuating said enabling device when the reset device is operated with the ignition switch in its Off-position.

4,682,063

CONTROL MOTOR FOR A SERVO VALVE

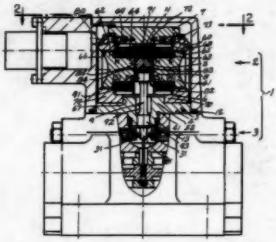
Herbert Lembke, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 820,730

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1985, 3501836

Int. Cl.[4] F15B *13/043*; H01F *7/14*

U.S. Cl. 310—29 **7 Claims**



1. A control motor for a servo valve, comprising:

pole means comprising a U-shaped support member including two diametrically oppositely disposed side wall elements defining an armature space;

a closing plate mounted to and extending between first ends of said sidewall elements;

first and second control spool elements supported by said pole means and disposed between said sidewall elements;

a thin walled tube;

a soft metal armature member resiliently mounted to said tube and disposed between said spool elements within said armature space; and

permanent magnet means including a permanent single polarized cobalt-samarium magnet mounted to said closing plate member for polarizing said armature member.

4,682,064

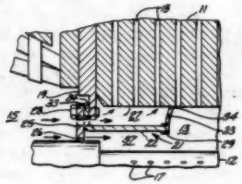
COOLANT GAS FLOW SEPARATOR BAFFLE FOR A DYNAMOELECTRIC MACHINE

Kim H. Crounse, Ballston Lake, and James B. Archibald, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,643

Int. Cl.[4] H02K *9/00*

U.S. Cl. 310—61 **9 Claims**



1. In a gas cooled dynamoelectric machine having a rotor and a stator, the stator spaced from and surrounding the rotor with an annular gap therebetween; a gas baffle positioned at least at one end of the dynamoelectric machine for limting the flow of gas collant into the annular gap from its adjacent dynamoelectric machine end, the gas baffle comprising:

a plurality of gas baffle segments surrounding the rotor and extending axially inward into the gap betweend the rotor and stator; the plurality of segments defining a radially outer annular passage in fluid communication with the dynamoelectric machine end and a portion of the stator

cooling passages; and, an inner annular passage surrounding the dynamoelectric machine rotor;

each baffle segment comprising a shell section which includes a support flange at its axially outer end for attaching the shell section to a dynamoelectric machine end; a sealing flange member at the axially inner end of the shell section for separating the outer passage from the inner passage; and,

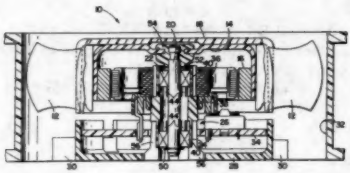
a separate plate member including a gas seal forming the axially outer end of the baffle for limiting gas coolant flow into the inner annular passage; the plate member and the shell section including the sealing flange member each being separately and independently adjustable.

4,682,065

MOLDED PLASTIC MOTOR HOUSING WITH INTEGRAL STATOR MOUNTING AND SHAFT JOURNALLING PROJECTION

George A. English, and Charles R. Marracino, both of Torrington, Conn., assignors to Nidec-Torin Corporation, Torrington, Conn.

Filed Nov. 13, 1985, Ser. No. 797,638
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 **14 Claims**



1. A molded plastic housing for a small electric motor having an annular stator and rotor arranged diametrically in inner-outer relationship and a central shaft operatively associated with and rotatable with the annular rotor disposed diametrically within the stator, said housing having at least one radially extending end wall and a centrally located and integrally molded stator mounting and shaft journalling tubular housing portion which projects axially from the end wall, said projecting housing portion having intermediate and axially spaced opposite end sections, the opposite end section being flexible, first and second bearings disposed respectively in the opposite end sections for rotatably receiving and holding said shaft, each of said opposite end sections having their flexibility enhanced by at least three axially extending and circumaxially spaced reduced diameter and reduced thickness zones at least approximately the length of its associated bearing, and each of said end sections having at least three circumaxially spaced narrow discrete reduced diameter zones which extend axially, each of said bearings and its associated end section having an interference fit at least at said reduced diameter zones, and said annular stator being mounted on and about said projecting tubular housing portion.

4,682,066

ALIGNMENT SYSTEM FOR PERMANENT MAGNET MOTORS

Salvatore R. Abbratozzato, Timonium; Richard T. Walter, Baldwin, and Dale K. Wheeler, Fallston, all of Md., assignors to Black & Decker Inc., Newark, Del.

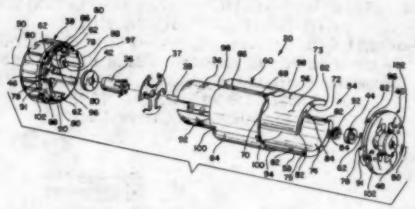
Filed Nov. 12, 1985, Ser. No. 796,928
Int. Cl.[4] H02K *21/28, 5/02*
U.S. Cl. 310—154 **14 Claims**

1. A permanent magnet motor for use in an electrically powered device, comprising:

two axially spaced end caps defining respective end cap bores, said end caps having opposing surfaces that are parallel to one another when said bores are axially aligned, and further having radially outwardly facing support surfaces located a predetermined radial distance from the axes of said bores;

an armature rotatably connected to said end caps via said end cap bores along an armature axis;

a permanent magnet array disposed about said armature and having an inner radial surface, an outer radial surface, and axial end surfaces, said inner radial surface engaging said



support surfaces of said end caps so as to define a predetermined air gap between said armature and said inner surface of said permanent magnet array; and

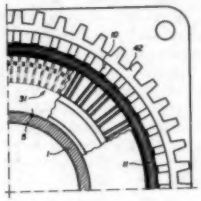
spring means comprising a one-piece longitudinally split tubular ferromagnetic wrapper connecting said two end caps and engaging said outer radial surface of said permanent magnet array for biasing said inner radial surface of said permanent magnet array against said support surfaces of said end caps.

4,682,067

SYNCHRONOUS ELECTRIC MOTOR HAVING A DISC-SHAPED PERMANENT MAGNET ROTOR

Claude Oudet, Besancon, France, assignor to Portescap, Chaux-de-Fonds, Switzerland

Filed May 7, 1986, Ser. No. 860,460
Claims priority, application Switzerland, May 10, 1985, 1998/85
Int. Cl.[4] H02K *21/12*
U.S. Cl. 310—156 **2 Claims**



1. A synchronous electric motor, comprising at least one rotor part of substantially annular disc form, magnetised axially so as to present, on its opposite flat faces, a series of magnetic poles of alternate polarities, disposed regularly along an annular zone of each face, the rotor part being mounted on a rotary shaft, the motor also comprising an assembly of several elementary magnetic circuits which are isolated magnetically from one another, an annular electric energizing coil which is coupled with the said assembly of elementary magnetic circuits, each of said circuits providing an air-gap and the assembly of these air-gaps forming an annular region in which are disposed the magnetised zones of the rotor part, each of the elementary magnetic circuits having a substantially flat C-configuration, being placed substantially radially with respect to said rotor shaft and having a central opening in which is placed said annular coil, the transverse sections of each elementary magnetic circuit, considered along the path of the magnetic

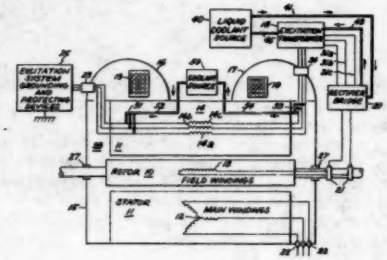
flux generated by said energizing coil, having a practically constant area, at least in the portions of the circuit situated in proximity to the air-gap, in the portions situated at the height of the central opening, measured from the rotor shaft, and in the portion opposite to the air-gap with respect to the central opening.

4,682,068

LIQUID COOLED STATIC EXCITATION SYSTEM FOR A DYNAMOELECTRIC MACHINE

George M. Cotzas, Schenectady; Morris V. VanDusen, Clifton Park, and Thomas E. VanSchaick, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,331
Int. Cl.[4] H02K *9/197*; H02P *11/00*
U.S. Cl. 310—198 **17 Claims**



1. A static excitation system for a dynamoelectric machine, the machine having a rotatable field winding for producing a rotating magnetic field, a stator core with a multiphase set of main armature windings disposed in slots in the stator core and first cooling means for providing a first coolant for cooling at least the set of main armature windings, the excitation system comprising:

a multiphase excitation transformer having a core and a set of respective primary windings respectively coupled to predetermined respective main armature windings of the set of main armature windings and a set of secondary windings, the secondary windings respectively corresponding to and in electromagnetic flux flow communication with the windings of the set of primary windings;

rectifier means electrically coupled to the set of secondary windings for supplying electrical energy to the field winding for producing the magnetic field;

wherein said excitation transformer includes first heat exchange means in heat flow communication with the primary and secondary windings and with the core of the excitation transformer, said first heat exchange means operationally including a liquid coolant for cooling the core of the transformer; and,

wherein the rectifier means includes second heat exchange means for cooling the rectifier means, the second heat exchange means coupled in series liquid coolant flow communication with the first heat exchange means.

4,682,069

KEY JOINT APPARATUS FOR ASSEMBLY OF ELECTRICAL MOTORS

Torvald Stahl, Alvsjo, Sweden, assignor to Flygt Aktiebolag, Solna, Sweden

Filed May 8, 1986, Ser. No. 861,011
Claims priority, application Sweden, May 14, 1985, 8502391
Int. Cl.[4] F16B *3/00*; H02K *1/22*
U.S. Cl. 310—261 **1 Claim**

1. Improved key joint apparatus for assembling an electric rotor to a shaft, said shaft having a longitudinally extending keyway disposed in an axial direction thereon, the improvement comprising a key having first and second parts fixed in position with respect to one another, said first part for being disposed in said axial direction in said longitudinally extending keyway on said shaft, said first part having a width and height corresponding substantially to the width and depth, respectively, exhibited by said keyway, and said second part being

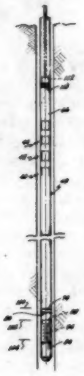
narrower than said first part and extending in a radial direction therefrom, said first part and said shaft having a common axial direction and said second part extending diagonally over at least a portion of said first part along an axis which is inclined to said axial direction, said axial direction and said axis not intersecting when extended.

4,682,070

DOWNHOLE OIL WELL VIBRATING SYSTEM

Plambeck Eric D., Carpinteria, Calif., assignor to Piezo Sona-Tool Corporation, Carpinteria, Calif.

Filed Jul. 30, 1984, Ser. No. 635,669
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—334 **16 Claims**



1. In combination for use in an oil well,

a plurality of transducer assemblies each including a transducer and a support member disposed in envelopeing relation to the transducer, the transducer assemblies having a cylindrical configuration and being disposed at spaced axial positions,

an electrical bus extending axially through the centers of the transducer assemblies,

electrical connections from the electrical bus to each of the transducers,

a mounting rail extending axially in abutting relationship to the transducer assemblies and coupled mechanically to the support members to support the transducer assemblies, the mounting rail being made from an electrically conductive material to serve as an electrical ground and to provide an electrical ground to the support members, and

a plurality of spacer means each supported by the mounting rail at a spaced position and each receiving the electrical

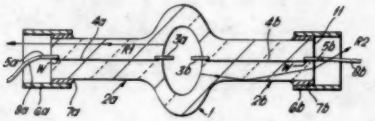
bus to support the electrical bus, each of the spacer means being made from an insulating material.

4,682,071

LAMPS AND RIBBON SEALS

Paul Thorpe, Greater Manchester, England, assignor to The General Electric Company, p.l.c., England

Continuation-in-part of Ser. No. 496,130, May 19, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 876,276
Claims priority, application United Kingdom, May 28, 1982, 8215699
Int. Cl.[4] H01J 5/32
U.S. Cl. 313—43 7 Claims



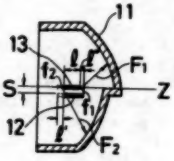
1. An air-exposed lamp of the kind having an envelope in which there is contained means for generating light, the envelope being provided with at least one elongate stem which is at least partially transparent to radiations emanating from the interior of the envelope in use of the lamp, said at least one stem having an end face at a position remote from the envelope, at least one current-supply foil embedded within and extending along said at least one stem and connected at its inner and outer ends to an inner conductor and a terminal conductor respectively, the foil being formed of a metal which is oxidizable when exposed to air at the elevated temperatures produced in use of the lamp, wherein the end face of said at least one stem is open to the atmosphere and is highly polished so that a large proportion of radiation from the lamp which is incident upon it is transmitted through it without being reflected back towards the foil so as to reduce the temperature of at least the outer end of the foil when the lamp is in use, and thus reduce the tendency to oxidation, thereby lengthening the lamp life.

4,682,072

HEADLAMP FOR VEHICLE

Takeo Ichihara, Hatano; Yukio Yamanaka, Yokohama, and Akihiko Tsurumaru, Sagamihara, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 634,877, Jul. 26, 1984, abandoned. This application Nov. 26, 1986, Ser. No. 935,117
Int. Cl.[4] H01J 5/16
U.S. Cl. 313—115 1 Claim



1. A headlamp for a vehicle in which a main filament and a sub-filament are arranged in parallel to a rotational axis of a paraboloidal surface of a reflector, and the sub-filament is positioned above the main filament, wherein:

the reflector is different in focal position of the paraboloidal surface thereof between an upper surface and a lower surface,

the focal point on the lower surface side is positioned frontwardly more than a length of the sub-filament from the focal point on the upper surface side,

the sub-filament is positioned between both the focal points, and

the main filament is longer than the sub-filament and is positioned thereunder and in parallel alignment therewith to produce corresponding different illumination patterns, the main filament producing a larger illumination pattern than the sub-filament, and the illumination pattern of the sub-filament being formed on proportion to the length of the sub-filament, wherein

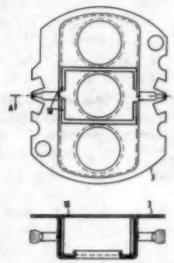
the main filament is disposed so as to extend beyond the sub-filament by an interval in the range 1 to $1+L/2$ such that 1 is the difference between the lengths of the main filament and the sub-filament, and L is the length of the main filament to thereby efficiently utilize luminescence to obtain a light distribution pattern of light luminous intensity and reduce the vertical dimension employed in said head lamp.

4,682,073

ELECTRON OPTICS FOR THE ELECTRON BEAM GENERATING SYSTEM OF A COLOR PICTURE TUBE

Norbert Staub, Denkendorf, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 480,208, Mar. 30, 1983, abandoned. This application Nov. 6, 1986, Ser. No. 928,663
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 321248
Int. Cl.[4] H01J 29/50, 29/56
U.S. Cl. 313—414 6 Claims



1. In an electron gun assembly usable in a multiple electron beam television picture tube wherein at least one of grid 3 or grid 4 includes a pot-shaped housing disposed in the electron beam generating system of said picture tube, said pot-shaped housing having a plurality of separate, spaced apart, apertures formed therein through which the electron beams pass, each of said apertures having a central axis, the axes of said apertures lying in a common plane,

an improvement wherein field forming devices utilized in said at least one of grid 3 or grid 4 consist of:

a first planar, rectangular, shielding member of magnetic material and means for affixing said member to the housing between a first selected pair of apertures through which pass first and second adjacent electron beams with said shielding member extending perpendicular to said plane;

a second planar, rectangular, shielding member of magnetic material spaced apart from said planar shielding member and affixed to the housing between a second selected pair of apertures through which pass second and third adjacent electron beams with said second shielding member extending perpendicular to said plane whereby said first and second shielding members are parallel to each other.

4,682,074

ELECTRON-BEAM DEVICE AND SEMICONDUCTOR DEVICE FOR USE IN SUCH AN ELECTRON-BEAM DEVICE

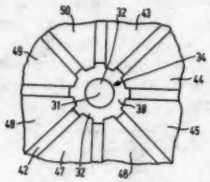
Arthur M. E. Hoeberechts, and Gerardus G. P. van Gorkom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,883

Claims priority, application Netherlands, Nov. 28, 1984, 8403613

Int. Cl.[4] H01J *29/04*

U.S. Cl. 313—444 20 Claims



1. An electron-beam device comprising in an evacuated envelope a target onto which at least one electron beam is focussed and a semiconductor emitter device for generating the at least one electron beam, which semiconductor emitter device comprises a semiconductor body having a major surface supporting a first electrically insulating layer having at least one aperture, which semiconductor body comprises at least one pn-junction at which electrons can be generated by means of avalanche multiplication by applying a reverse voltage across the pn-junction, which electrons emanate from the semiconductor body at the location of the aperture in the first electrically insulating layer to form the electron beam, which first insulating layer supports at least one accelerating electrode having a portion thereof disposed adjacent the edge of said aperture, said electrode being at least partly covered with a second electrically insulating layer which leaves the aperture in the first insulating layer exposed and which carries electrodes for influencing the electron beam, characterized in that the electrodes on the second electrically insulating layer comprise at least four-beam forming electrodes which are regularly spaced around the aperture and have means electrically connected thereto for applying respective potentials for producing at least one n-pole field, where n is an even integer which is greater than or equal to 4 and smaller than or equal to 16.

4,682,075

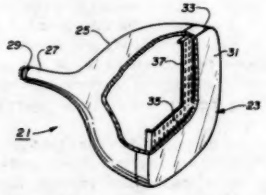
IMAGE DISPLAY INCLUDING IMPROVED LIGHT-ABSORBING MATRIX

Jordan R. Nelson, Pennington, and William K. Wissing, Yardville, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1985, Ser. No. 811,118

Int. Cl.[4] H01J *29/32, 29/28*

U.S. Cl. 313—466 7 Claims



1. In an image display including a viewing screen comprising spaced elemental image areas and a light-absorbing matrix adjacent said spaced areas,

the improvement comprising said matrix consisting essentially of partially-graphitized carbon black particles.

4,682,076

MICROWAVE TUBE WITH IMPROVED OUTPUT SIGNAL EXTRACTING STRUCTURE

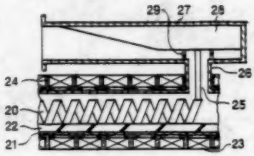
Takao Kageyama, and Ryuzo Orui, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 15, 1985, Ser. No. 755,412

Claims priority, application Japan, Jul. 16, 1984, 59-147128

Int. Cl.[4] H01J *25/00*

U.S. Cl. 315—4 10 Claims



9. A helix slow-wave circuit type travelling wave tube which includes an evacuated envelope containing an electron gun means located at one end thereof for providing a beam of electrons and a collector means located at the other end of the evacuated envelope for collecting the electron beam provided by the electron gun means, a helix slow-wave circuit located in the evacuated envelope in such a manner that the electron beam passes through the slow-wave circuit to the collector, means at an upstream side of the electron beam for applying a microwave signal to the slow-wave circuit, and means at a downstream side of the electron beam for extracting an amplified output signal from the slow-wave circuit, said circuit being characterized in that the output signal extracting means comprises a coaxial line including an outer conductor which is air-tightly fixed at one end thereof to the evacuated envelope and an inner conductor having one end connected to one end of the helix slow-wave circuit at an angle to the center axis of the electron beam; an output waveguide which is air-tightly fixed to the other end of the coaxial line outer conductor so that the other end of the coaxial line inner conductor extends into the output waveguide; a resistive ridge formed on an inner wall surface of the output waveguide to oppose the inner conductor of the coaxial line, a dielectric hollow cylindrical member positioned in the output waveguide to surround the other end of the coaxial line inner conductor, the cylindrical member being air-tightly fixed at its one end to the inner wall of the output waveguide and at its other end to the ridge formed in the output waveguide, and the other end of the coaxial line inner conductor being connected to the ridge formed in the output waveguide.

10. A microwave tube as claimed in claim 9 wherein the cylindrical member is made of ceramic.

4,682,077

TELEVISION CAMERA TUBE DEVICE

Masanori Maruyama, Kokubunji; Masamichi Moriya; Shinichi Kato, both of Mobara; Masakazu Fukushima, Tokyo; Yasuhiko Nonaka, Mobara, and Chihaya Ogusu, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai and Hitachi, Ltd., both of Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,014

Claims priority, application Japan, Jul. 18, 1984, 59-147540

Int. Cl.[4] H01J *29/46;* H04N *5/228*

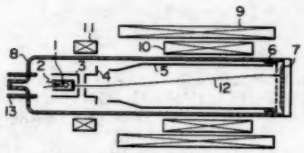
U.S. Cl. 315—14 12 Claims

1. A television camera tube device comprising:

a cathode electrode for emission of electrons along a beam path;

a first grid electrode following said cathode electrode on said beam path, said first grid electrode having a first aperture and being connected to receive a positive voltage at a first voltage level relative to the potential of said cathode electrode so as to produce a laminar flow electron beam;

a second grid electrode following said first grid electrode on said beam path, said second grid electrode having a second aperture which is smaller than said first aperture and being connected to receive a positive voltage relative to said cathode electrode which is higher in level than that applied to the first grid electrode; and



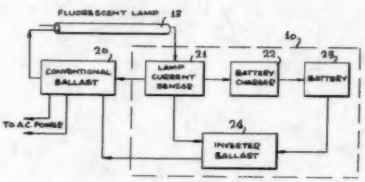
means for decreasing said positive voltage applied to said first grid electrode from said first level to a second level to change said electron beam from a laminar flow beam to a beam having a cross-over adjacent said second grid electrode, thereby increasing the amount of the electrons passing through said second aperture.

4,682,078

WIRELESS EMERGENCY LIGHTING UNIT

Chiriac Pascalide, North Hollywood, Calif., assignor to Radiant Illumination, Inc., North Hollywood, Calif.

Filed Jan. 28, 1985, Ser. No. 695,277
Int. Cl.[4] H05B *37/00, 41/14*
U.S. Cl. 315—86 **1 Claim**



1. An externally wireless emergency power unit for use with a standard fluorescent lamp of the type mountable in a conventional fixture incorporating conventional ballast means and operable when powered by an AC line through said conventional ballast means, said lamp being illuminated when power from said AC line is operatively connected to first and second terminals on said fixture, said emergency power unit being operable to illuminate said lamp when the AC line voltage falls below a predetermined level, said unit comprising:

a unitized elongated housing and circuit means wholly enclosed within said housing;

said housing comprising connectors carried on its opposite ends, one of said connectors being adapted to be inserted in one socket of said conventinal fixture and the other of said connectors being adapted to engage with a connector at one end of said standard fluorescent lamp, the connector at the other end of which is adapted to engage another socket of said fixture;

said circuit means comprising a pair of leads adapted to be connected through said one connector from said ballast means to apply a voltage derived from said AC line to a first winding of a heater voltage transformer within said emergency unit, a second winding of said transformer being connected through said other connector to said one end of said lamp;

a rechargable storage battery;

a battery charging circuit for charging said battery;

an inverter circuit including a transistor having a collector-emitter circuit energizable from said battery;

sensor means for sensing said voltage across said pair of leads to determine when said voltage falls below a predetermined level; and

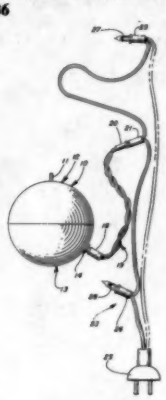
switch means, including a switch contact connecting the emitter of said collector-emitter circuit and one side of said battery, responsive to said sensor when said voltage is at or above said level, for connecting said battery charging circuit to derive charging current from current flowing through said lamp and disabling said inverter circuit by opening said switch contact and, when said voltage falls below said level, for disabling said charging circuit and connecting said battery across the collector-emitter circuit of said inverter circuit by closing said switch contact and connecting the output voltage from said inverter circuit betwen said other connector connected to said one end of said fluorescent lamp and, through one of said leads, said one connector and said ballast means, to the other end of said lamp, whereby said lamp is illuminated from said battery when said voltage falls below said level, said sensor means comprising a rectifier bridge having its input terminals connected across said pair of leads and having its output terminals connected across a single relay coil, said single relay coil controlling said switch means.

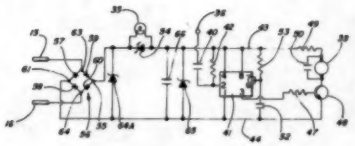
4,682,079

LIGHT STRING ORNAMENT CIRCUITRY

Robert E. Sanders, Lenexa, Kans.; Charles J. Flynn, and John L. Vertreese, both of Kansas City, Mo., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Oct. 4, 1984, Ser. No. 657,680
Int. Cl.[4] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—186 **30 Claims**





1. An ornament for installation in a string of lights connected to an AC line voltage source to be in series with the lights of the string, said ornament comprising: ornamental means for producing attractive visual effects, an electrically operated load device arranged when energized to produce sensory effects augmenting the attractive visual effects produced by said ornamental means, a coupling circuit having a pair of input

terminals and a pair of output terminals and arranged to provide a path for current flow from one input terminal and thence in one direction from one output terminal to the other through a load coupled thereto and then to the other input terminal and to also provide a path for current flow from said other input terminal and thence in said one direction from said one output terminal to the other through load coupled thereto and thence to said one input terminal to thereby provide for AC current flow between said input terminals of said coupling circuit while providing for DC current flow through said load, means arranged for connecting said input terminals of said coupling circuit in said string of lamps in series relation to all other lamps of said string, connection means defining a load which includes said load device and which is connected to said output terminals of said coupling circuit, and protection means operative in the absence of current through said load for insuring a path for current flow of at least a certain magnitude in said one direction from said one output terminal to said other output terminal and insuring AC current flow through all lights of said string, said certain magnitude of current flow being sufficient for energization of all lights of said string at substantially full intensity, and said protection means being effective for limiting the voltage between said output terminals of said coupling circuit, to thereby insure AC current flow through lights of said string irrespective of DC current drawn by said connection means and to protect against excessive voltages between said input terminals of said coupling circuit and across said connection means.

4,682,080

DISCHARGE LAMP OPERATING DEVICE

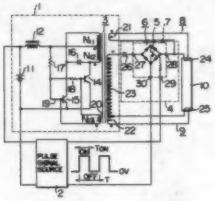
Soichiro Ogawa, and Yoshio Watanabe, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

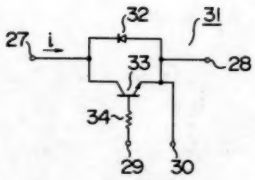
Filed Aug. 16, 1985, Ser. No. 766,197

Claims priority, application Japan, Aug. 17, 1984, 59-170414; Aug. 17, 1984, 59-170415

Int. Cl.[4] H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **16 Claims**





1. A discharge lamp operating apparatus having a dimming function comprising:

an inverter having first secondary windings to be connected to electrodes of a discharge lamp for supplying currents continuously to heat said electrodes and a second secondary winding to be connected to said electrodes for causing a discharge current to flow between said electrodes;

discharge current supply means connected between said second secondary winding and said electrodes for supplying said discharge current, including switching means connected to said second secondary winding for controlling the supply of the discharge current to said electrodes at a duty factor determined by a desired dimming factor, and a capacitor connected in series with said second secondary winding and said switching means, and said switching means being formed by an anti-parallel connection of a first diode and a transistor.

4,682,081

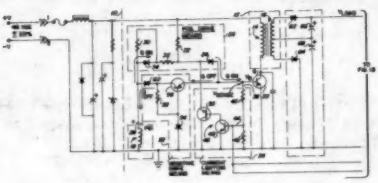
SINGLE-ENDED, SELF-OSCILLATING DC-DC CONVERTER FOR INTERMITTENTLY ENERGIZED LOAD HAVING V_{BE} RESPONSIVE CURRENT LIMIT CIRCUIT

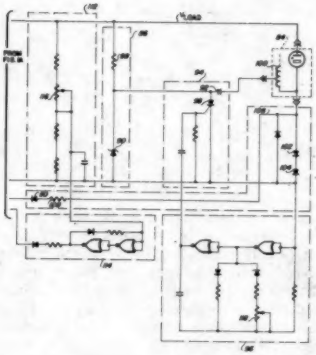
Scott T. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Tempe, Ariz.

Filed Nov. 4, 1985, Ser. No. 794,415

Int. Cl.[4] H05B *41/29, 41/34*

U.S. Cl. 315—219 **33 Claims**





1. Apparatus for delivering current to an intermittently energized load comprising:

a. a coupled inductor including a primary winding, a secondary winding and a feedback winding;

b. a switching transistor having base, collector and emitter terminals and being coupled in series with said primary winding for switching between conductive and non-conductive states to control the flow of current through said primary winding;

c. positive drive means coupled to the base of said switching transistor for providing a positive bias voltage to said switching transistor to switch into and maintain said switching transistor in the conductive state to transfer energy into said inductor;

d. current limiting means for removing the positive bias voltage from said switching transistor when the primary winding current reaches a predetermined value to thereby switch said switching transistor out of the conductive

state and into the non-conductive state, said current liming means including

i. voltage threshold sensing means for comparing the base to emitter voltage of said switching transistor to a fixed threshold voltage representative of a preselected collector current limit of said switching transistor and for generating a control signal when the switching transistor base to emitter voltage exceeds the fixed threshold voltage;

ii. positive removal means coupled to said voltage threshold sensing means and to said positive drive means for removing the positive bias voltage from said switching transistor in response to the control signal from said voltage threshold sensing means;

e. a load coupled to said secondary winding for receiving energy stored in said inductor after said switching transistor is switched into the non-conductive state by said current limiting means; and

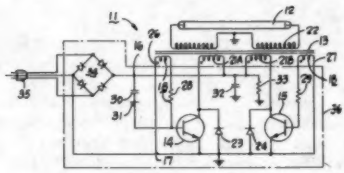
f. negative drive means coupled between said feedback winding and the base of said switching transistor for supplying a constant negative bias voltage to the base of said transistor as energy is transferred from said inductor into said load, wherein the negative bias voltage remains constant as the voltage across said feedback winding varies.

4,682,082

GAS DISCHARGE LAMP ENERGIZATION CIRCUIT

Robert B. MacAskill, Bay Village, and Jeffrey J. Braun, Parma, both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed May 16, 1985, Ser. No. 734,546
Int. Cl.[4] H05B *41/14*
U.S. Cl. 315—219 **16 Claims**



1. An electronic energization circuit for a luminous gas discharge lamp comprising, in combination:

a transformer having a generally rectangular hysteresis loop;

at least one primary winding on said transformer;

secondary winding means on said transformer having an output connectable to said lamp;

input terminals for supplying a voltage to said electronic energization circuit;

a first semiconductor connected to said at least one primary winding and to said input terminals; and

control means connected to said semiconductor to eliminate striations in the gas plasma within the lamp by establishing unequal on and off times of said semiconductor.

4,682,083

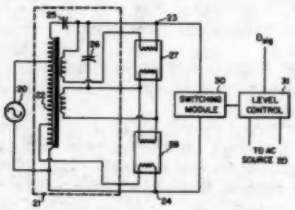
FLUORESCENT LAMP DIMMING ADAPTOR KIT

Robert P. Alley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 665,673, Oct. 29, 1984, abandoned.
This application Jul. 11, 1986, Ser. No. 883,469
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—307 **26 Claims**

1. An add-on fluorescent lamp dimming adaptor for connecting to a conventional nondimming ballast in a fluorescent lighting system, said system including a source of ac voltage, said ballast having terminals for connecting to a fluorescent lamp, said adaptor comprising:

a switching module adapted to be coupled to said terminals for switching current from said lamp, said switching module being connected in parallel with said lamp so as to divert current from said lamp when said switching module conducts; and



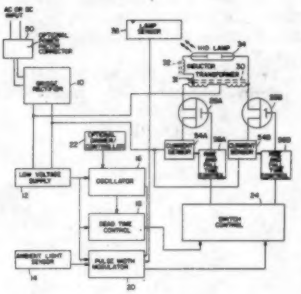
a level control coupled to said switching module, said level control controlling the conductive state of said switching module to vary the current in said lamp according to a dimming control signal supplied to said level control, said level control causing said switching module to switch at a frequency in the range of 300 hertz and higher during times that said lamp current is being varied.

4,682,084

HIGH INTENSITY DISCHARGE LAMP SELF-ADJUSTING BALLAST SYSTEM SENSITIVE TO THE RADIANT ENERGY OR HEAT OF THE LAMP

Donald S. Kuhnel, Houston, and Sidney A. Ottenstein, Spring, both of Tex., assignors to Innovative Controls, Incorporated, Houston, Tex.

Filed Aug. 28, 1985, Ser. No. 770,663
Int. Cl.[4] G05F *1/00*; H05B *37/02, 37/04, 41/36*
U.S. Cl. 315—307 **6 Claims**



1. A self-adjusting ballast system for mercury vapor, high intensity discharge lamps having outputs of 100 watts or greater, comprising:

a direct current source;

a lamp circuit containing a high intensity discharge lamp;

sensing means for sensing the radiant energy output of said lamp;

a pulse width modulator which, in response to the output of said sensing means, varies the width of the pulses that power said lamp during warm-up of said lamp;

a high frequency oscillator;

a DC to AC converter that converts current from said direct source to pulses of alternating current for powering said lamp, said converter comprising:

at least one switch for gating current to said lamp;

a switch control means, responsive to said high frequency oscillator, for controlling said switch and thereby controlling the frequency of the alternating current pulses that power said lamp;

current sensing means for sensing the current being supplied to said lamp; and

current control means for limiting the current through said lamp to a predetermined safe level when the current sensed by said current sensing means exceeds a reference value.

2. A self-adjusting ballast system for mercury vapor, high intensity discharge lamps having output of 100 watts or greater, comprising:

a direct current source;

a lamp circuit containing a high intensity discharge lamp;

sensing means for sensing the heat output of said lamp;

a pulse width modulator which, in response to the output of said sensing means, varies the width of the pulses that power said lamp during warm-up of said lamp;

a high frequency oscillator;

a DC to AC converter that converts current from said direct current source to pulses if alternating current for powering said lamp, said converter comprising:

at least one switch for gating current to said lamp;

a switch control means, responsive to said high frequency oscillator, for controlling said switch and thereby controlling the frequency of the alternating current pulses that power said lamp;

current sensing means for sensing the current being supplied to said lamp; and

current control means for limiting the current through said lamp to a predetermined safe level when the current sensed by said current sensing means exceeds a reference value.

4,682,085

GULLWING DISTORTION CORRECTED DEFLECTION CIRCUITRY FOR A SQUARE-PLANAR PICTURE TUBE

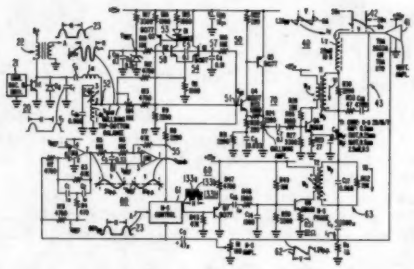
Peter E. Haferl, Adliswil, Switzerland; Hugh F. Sutherland, II; David W. Luz, both of Indianapolis, Ind.; James A. McDonald; George C. Waybright, both of Carmel, Ind., and Donald H. Willis, Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 10, 1985, Ser. No. 733,661

Claims priority, application United Kingdom, Jun. 12, 1984, 8414946; Jun. 12, 1984, 8414947

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **31 Claims**



1. Picture tube display apparatus with gullwing raster distortion correction, comprising:

a picture tube having a phosphor screen located on an aspherical faceplate of relatively flat contour;

line and field deflection circuits for generating line and field deflection currents in respective line and field deflection windings to scan a raster on said phosphor screen, said raster thereby being subject to gullwing distortion; and

gullwing distortion correction means responsive to a first signal repeating at a line rate and to a second signal repeating at a field rate for modulating said field deflection current during a line deflection period within the field deflection trace interval in a manner that produces gullwing distortion correction of the corresponding raster scan line.

4,682,086

CATHODE RAY TUBE DISPLAY SYSTEMS

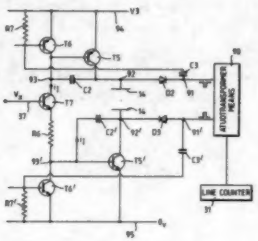
Andrew M. Mallinson, Salem, N.H., and Adrian H. W. Hoodless, Radwell, England, assignors to Ferranti, plc, Cheshire, England

Filed Sep. 14, 1984, Ser. No. 650,642

Claims priority, application United Kingdom, Sep. 15, 1983, 8324712

Int. Cl.[4] H01J *29/56, 29/70, 29/72*

U.S. Cl. 315—371 **10 Claims**

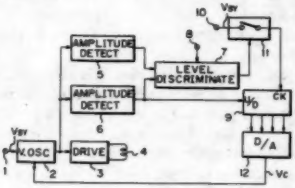


1. A cathode ray tube (CRT) display system including distortion correction means for the CRT having digital means arranged to provide digital output signals to drive at least one digital-to-analogue converter (DAC), in response, said at least one DAC being arranged to generate a function, to shape the waveforms of deflection signals to be applied to one pair of deflection plates of the CRT, partially to cause a conventional raster scan pattern co-incident with the CRT screen, the digital means providing digital output signals, in response, the DAC being arranged to generate the function, respresentative of variations of the corresponding analogue output from the DAC, the analogue output of the DAC being applied to the associated pair of deflection plates of the CRT via integrating means, the integrating means including two integrators, each integrator including an amplifier and a feedback capacitor, there also being provided means to supply pulses, negative-going pulses to be supplied to one integrator, and positive-going pulses to be supplied to the other integrator, in operation, and when the pulses are removed, in response to an appropriate signal from the digital means, current flowing from the capacitor of said one integrator to the capacitor of said other integrator, and the arrangement being such that a positive-going voltage ramp is applied to one deflection plate, and a negative-going voltage ramp is applied to the other deflection plate, of the required sawtooth waveforms to be applied to the deflection plates, and the current flowing between the two capacitors is arranged to flow through an input bipolar transistor, and a resistor, the varying analogue output from the DAC causing a potential, in relation to a datum reerence potential, to be applied to the base of the input transistor, so that the varying analogue output applied to the base of the input transistor causes corresponding variations of the sawtooth waveforms, to cause distortion of the raster scan pattern, otherwise obtained, to be corrected.

4,682,087
APPARATUS FOR CONTROLLING AMPLITUDE OF VERTICAL DEFLECTION SIGNAL

Masafumi Kikuchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00293, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05751, PCT Pub. Date Dec. 19, 1985.
PCT Filed May 29, 1985, Ser. No. 833,402
Claims priority, application Japan, May 29, 1984, 59-109257
Int. Cl.[4] H02J *29/70;* **H04N** *5/52*
U.S. Cl. 315—387 **7 Claims**



1. An apparatus for controlling an amplitude of a vertical deflection signal comprising:

a vertical oscillating circuit for generating a sawtooth signal having a vertical period;

a detecting circuit for detecting whether an amplitude of said sawtooth signal is in a proper level range;

a counter for counting a vertical synchronizing signal when the amplitude of said sawtooth signal is out of said range in response to an output of said detecting circuit; and

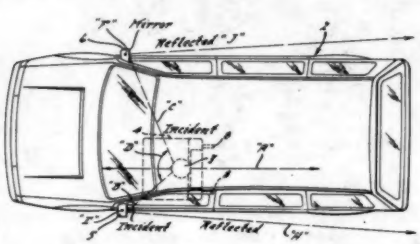
a D/A converter for converting an output of said counter into an analog detection signal,

characterized in that an amplitude of a vertical deflection signal formed by said sawtooth signal is controlled by an output of said D/A converter.

4,682,088
POWER MEMORY SEAT AND MIRROR CONTROL SYSTEM

Thomas M. Sullivan, Grosse Pointe Woods, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 10, 1986, Ser. No. 849,984
Int. Cl.[4] G05B *19/29*
U.S. Cl. 318—568 **5 Claims**



1. A power memory seat and mirror control system for controlling movement of an adjustable seat in a vehicle in conjunction with controlling movement of an adjustable driver door rearview mirror and an adjustable passenger door rearview mirror, said seat being the type having a first motive power means adapted to slideably move a seat cushion of said seat along a pair of transport tracks between front rear end stops of said pair of tracks, a second motive power means adapted to move attitudinally a front end and a back end of said seat cushion to a plurality of chosen height positions above said pair of tracks, and a third motive power means adapted to tilt a seat back of said seat from a chosen upright position through a plurality of recline positions; said driver door mirror and said passenger door mirror being the type having a fourth motive power means adapted for angular rotation of said driver door mirror about a first vertical driveshaft protruding from a driver door, a fifth motive power means adapted for angular rotation of said driver door mirror about a horizontal axis of a first horizontal drive shaft protruding from said driver door, a sixth motive power means adapted for angular rotation of said passenger door mirror about a second vertical drive shaft protruding from a passenger door and a seventh motive power means adapted for angular rotation of said passenger door mirror about said horizontal axis of a second horizontal drive shaft protruding from said passenger door, said first and second vertical and horizontal drive shafts, respectively, having keepers for limiting rotations of said driver door mirror and said passenger door mirror to within chosen limitations, the system comprising:

(a) switch means, coupled to each of said first through seventh motive power means being manually actuatable for generating supply voltage level signals for driving each of said first through seventh motive power means when adjusting said seat cushion and said seat back, said driver door mirror and said passenger door mirror to desired locations;

(b) potentiometer means cooperating with each of said first through seventh motive power means for providing analog voltage indicative of the amount of horizontal and attitudinal movement of said seat cushion, the amount of tilt of said seat back and the amount of angular rotation of said driver door mirror and said passenger door mirror from an initial position to a final position in response to manual actuations of said switch means;

(c) a first buffer means in a control module cooperating with said switch means for receiving said generated supply voltage level signals from said switch means, converting said supply voltage level signals to independent switch logic level signals, and storing said independent switch logic level signals in respective registers;

(d) a second buffer means in said control module cooperating with said potentiometer means for receiving said analog voltages from said potentiometer means, converting said analog voltages into independent equivalent digital number words, and storing said independent equivalent digital number words in respective registers;

(e) microcomputer means in said control module interconnecting said first buffer means, and said second buffer means for performing logic and analog functions for controlling said system, said microcomputer means comprising a motor control means for driving said motive power means of said seat, of said driver door mirror, and of said passenger door mirror in response to control signals from control circuits within said microcomputer means; memory means including a static random access memory means for temporarily storing said independent switch logic level signals and said independent equivalent digital number words, and a nonvolatile storage memory means for long duration storing of said independent switch logic level signals and said independent equivalent digital number words; said microcomputer means providing control signals to said motor control means during an automatic mode of operation of said system, and said microcomputer means providing means for determining end stop locations so that movement of said seat and said driver door and passenger door mirrors is so controlled so as to prevent said seat and said mirrors from abutting said end stops, whereby wear and tear of said end stops are prevented; said motor control means in said microcomputer means being interconnected to a motor buffer means within said control module for interfacing said motor control means to said first through seventh motor power means.

(f) memory switch means coupled to said first buffer means comprised of at least one set switch and a first driver store switch and a second driver store switch, said set switch being actuated with either said first driver store switch or

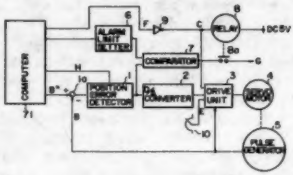
said second driver store switch to transfer said stored independent switch logic level signals and said stored independent equivalent digital number words into said non-volatile storage memory means converting said independent signals and words into non-volatile data used by said microcomputer for providing control signals to said motor control means during an automatic mode of operation of said system.

4,682,089

ROBOT CONTROL SYSTEM

Masumi Tamari, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1985, Ser. No. 808,499
Claims priority, application Japan, Dec. 17, 1984, 59-264626
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568 **8 Claims**



1. A control system for a robot having an operation axis and a servo motor driving the operation axis, said control system comprising:

(a) position error detecting means detecting an error of the actual position with reference to a desired instantaneous position;

(b) a drive circuit responsive to the position error for supplying a current to the servo motor to reduce the position error;

(c) limit means for limiting the current supplied from the drive circuit to the servo motor, thereby to limit the torque of the servo motor;

(d) switching means for turning on or off said limit means; and

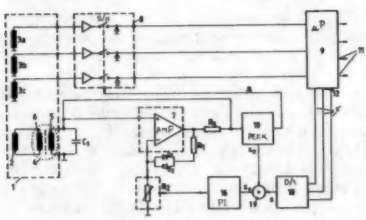
(e) means for setting a limit value, wherein the drive circuit comprises an operational amplifier with a limiter limiting the output of the operational amplifier to said limit value set by said setting means.

4,682,090

RESOLVER CIRCUIT

Karl-Heinz Schmidt, and Artur Seibt, both of Vienna, Austria, assignors to Voest-Alpine Automotive m.b.H., Linz, Austria

Filed Aug. 6, 1986, Ser. No. 893,657
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—661 **20 Claims**



1. A resolver circuit for maintaining the quality of the function generator's rotor signal furnished by signal windings of the function generator in accordance with the angular position of the rotor and an excitation signal supplied to the function generator through an adjustable transformer which has a primary winding and a secondary winding, said circuit comprising:

a capacitor associated with a winding of the adjustable transformer to form a parallel inductive capacitive circuit;

an oscillation amplifier having inverting and noninverting inputs, and an output which supplies the excitation signal to the primary winding of the automatic transformer which is connected in a positive feedback path about said oscillation amplifier;

nonlinear means in a negative feedback path about said oscillation amplifier;

a microcomputer for receiving the rotor signal and generating a control signal representative of the quality of the rotor signal;

summing means for receiving the control signal and an excitation quality signal representative of the quality of the excitation signal and providing a difference signal representative of the difference between the control signal and the excitation quality signal; and

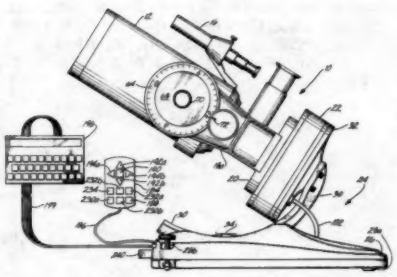
gain altering means associated with a feedback path about said oscillation amplifier for altering the gain associated with the feedback path in response to the difference signal.

4,682,091

TELESCOPE CONTROL SYSTEM

John J. Krewalk, West Lake Village, Calif., and Eric C. Silverberg, Austin, Tex., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,748
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—685 **18 Claims**



1. A control for a telescope mounted for pivotal motion about at least one axis, the control comprising:

means for driving the telescope to pivot about the axis, said driving means including a stepper motor coupled to the telescope to pivot the telescope about said axes in discrete, stepped increments, each increment corresponding to a control pulse issued to the driving means;

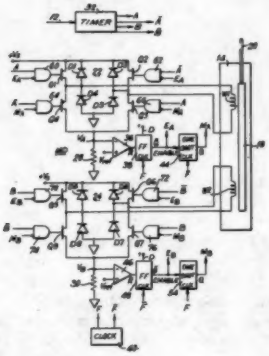
means for issuing an index signal when the telescope is at a reference position; and

means for generating control pulses and issuing said pulses to the driving means for controlling the telescope to pivot about the axis, said control means including means for accounting for pulses issued relative to said reference position to control the position of the telescope.

4,682,092
SYNCHRONOUS MOTOR DRIVE WITH CHOPPER REGULATOR

John Pellegrino, 31 Bennington St., Quincy, Mass. 02169, and Simyon Palmin, 11 Sandy Ridge Cir., Sharon, Mass. 02067

Filed Jun. 6, 1985, Ser. No. 741,877
Int. Cl.[4] H02K 19/10
U.S. Cl. 318—696 21 Claims



1. For energizing windings of a motor from a source, a motor driver, comprising:

a first switching circuit having switches for alternately applying current to one of the windings during successive periods;

first measuring means for measuring the current through the winding;

first interrupt means for enabling and disabling said switches during a period; and

first timing means responsive to said measuring means and coupled to said interrupt means for causing said interrupt means to enable and disable said switches during a period to produce a power cycle in which current flows through the winding, then a first circularing cycle in which current flows from the winding and back to the winding entirely within the switching circuit and outside the source, and then a reset cycle in which current flows from the winding through the source against the polarity of the source;

a second switching circuit having switches for applying current to a second winding during successive periods;

second measuring means for measuring the current through the second windings;

second interrupt means for enabling and disabling the switches during a second period 90 offset form the first period; and

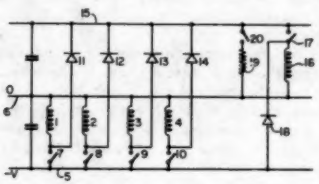
second timing means responsive to said second measuring means and coupled to said second interrupt means for causing said second interrupt means to enable and disable said switches during a period to produce current flows during a second set of cycles corresponding to the power cycle, the circulating cycle, and the reset cycle of asid first timing means in said second winding; and

coordinating means for constraining said first timing means and said second timing means to cause the reset cycle of one winding to occur during the power cycle of the other winding.

4,682,093
POWER SUPPLY SYSTEMS FOR INDUCTIVE ELEMENTS

John Murphy, Bishopstown; Francis McMullin, Clare; Michael Egan, Wilton; John V. Byrne, Dublin, and Patrick Kenneally, Clare, all of Ireland, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 18, 1985, Ser. No. 789,036
Claims priority, application Ireland, Oct. 19, 1984, 2700/84; Apr. 16, 1985, 959/85
Int. Cl.[4] H02P 7/36
U.S. Cl. 318—701 4 Claims

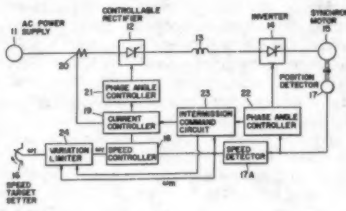


3. A power supply for a plurality of inductive elements, said system having first, second and third rails, said first and second rails being energizable at differing potentials and each said element being switchingly connectible between the rails, and the system including means for current flow between each said element and said third rail when the connection of said element between the first and second rails is broken, a further inductive element of substantially the same value of inductance as each of said plurality of inductive elements being switchingly connectible between said third rail and one of said first and second rails, and the system also comprising means for connecting said further element between said third rail and said one of the first and second rails when the voltage on the third rail is equal to or greater than a predetermined value and means for current flow between the further inductive element and the other of said first and second rails when the connection of said further element between the third rail and said one of the first and second rails is broken.

4,682,094
CONTROL SYSTEM FOR A POWER CONVERTER DRIVING A SYNCHRONOUS MOTOR

Akihiko Kuroiwa, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 22, 1985, Ser. No. 800,769
Claims priority, application Japan, Nov. 27, 1984, 59-250106
Int. Cl.[4] H02P 5/40, 5/28
U.S. Cl. 318—723 8 Claims



1. A method of controlling a power converter driving a synchronous motor, said power converter comprising a controllable rectifier converting an AC power into a DC power and an inverter of a load commutation type converting the DC power into an AC power of a variable frequency which is

supplied to said synchronous motor, said method comprising the steps of:

providing a speed target;

providing a speed reference in accordance with the speed target, the speed reference being varied to follow the speed target but within a variation rate;

detecting the speed of the synchronous motor;

producing, by use of a speed controller, a current reference in accordance with the speed reference and the detected speed;

detecting the current of said rectifier;

adjusting the average current through the rectifier in accordance with the current reference and the detected current thereby to reduce the deviation of the detected speed from the speed reference;

detecting the rotary position of the synchronous motor;

determining the firing phase angle of the inverter in accordance with the detected rotary position;

causing intermission of the current through the rectifier for intermission commutation of the inverter when the detected speed is below a predetermined threshold;

resetting the current reference at zero and the speed reference at the actual speed when the detected speed exceeds said predetermined threshold; and

causing load commutation of the inverter when said detected speed is higher than said predetermined threshold.

4,682,095

CIRCUIT ARRANGEMENT FOR CONTROLLING STARTING CURRENT OF A MOTOR

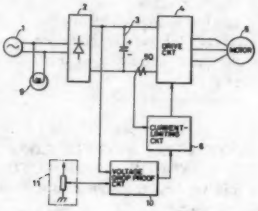
Nobuho Shibata; Isamu Yasunobu; Shigeo Neki; Kenichi Ohara, and Takashi Dohi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Japan

Filed Jun. 20, 1986, Ser. No. 876,913

Claims priority, application Japan, Jun. 20, 1985, 60-134576

Int. Cl.[4] H02P *1/26*

U.S. Cl. 318—778 **4 Claims**



1. A circuit arrangement for controlling starting current of motor arranged to be driven by a power circuit including a rectifying means responsive to a.c. voltage source, a capacitor for smoothing rectified voltage from said rectifying means, and a drive circuit for driving said motor using a d.c. voltage across said capacitor, said circuit arrangement comprising:

(a) a first comparator responsive to said voltage across said capacitor and a reference voltage for producing an output voltage when said voltage across said capacitor is below said reference voltage;

(b) a current detecting circuit for detecting current to said drive circuit or current to said motor;

(c) a second comparator responsive to a voltage indicative of said current detected by said current detecting circuit and to a second reference voltage which is variable in response to said output voltage from said first comparator, said second comparator being arranged to produce an output signal when said voltage indicative of said current is higher than said second voltage; and

(d) a control circuit responsive to said output signal from said second comparator for controlling said drive circuit to control said current to said motor.

4,682,096

SWITCHING REGULATOR SYSTEM FOR A MOTOR DRIVING CIRCUIT

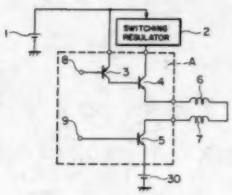
Hideo Nishijima; Takayasu Ito, and Isao Fukushima, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,500

Claims priority, application Japan, Oct. 11, 1984, 59-211329

Int. Cl.[4] H02P *5/28*

U.S. Cl. 318—808 **6 Claims**



1. A motor driving circuit comprising:

a first PNP transistor having the emitter connected to a first reference power source;

a first NPN transistor having the base connected to the collector of said first PNP transistor;

a second NPN transistor having the emitter connected to a second reference power supply;

a motor driving coil connected between the emitter of said first NPN transistor and the collector of said second NPN transistor; and

a switching regulator of a step-down and variable type connected between said first reference power supply and the collector of said first NPN transistor, the output voltage of said switching regulator being controlled by a collector voltage of said first NPN transistor,

wherein the base of said first PNP transistor and the base of said second NPN transistor are controlled.

4,682,097

CHARGING SYSTEM FOR AN AUTOMOTIVE ENGINE

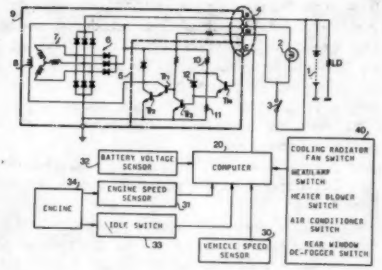
Fujio Matsui, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 871,028

Claims priority, application Japan, Jun. 8, 1985, 60-124762

Int. Cl.[4] H02J *7/16*

U.S. Cl. 320—64 **3 Claims**



1. A charging system for an automotive engine having a regulator for regulating the charge of battery, a vehicle speed sensor, an engine speed sensor, and an electric load sensor, the system comprising:

first means for obtaining a balance vehicle speed at which mean charging current and mean discharging current are substantially balanced;

second means for deciding a charge stop vehicle speed corresponding to the balance vehicle speed;

comparing means for comparing an actual vehicle speed with the charge stop vehicle speed and for producing a charge stop signal;

third means responsive to the charge stop signal for disabling the regulator so as to stop the charging of the battery.

4,682,098

VOLTAGE-CURRENT CONVERTER

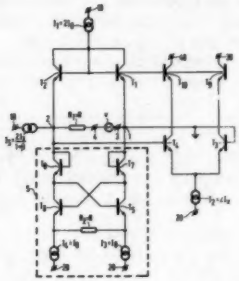
Evert Seevinck, Eindhoven; Roelof F. Wassenaar, Enschede, and Eerke Holle, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1986, Ser. No. 880,854

Claims priority, application Netherlands, Jul. 1, 1985, 8501882

Int. Cl.[4] G05F *3/20, 1/56*

U.S. Cl. 323—315 **8 Claims**



1. A voltage-current converter comprising: a first and a second supply terminal, a first current source coupled at one end to the first supply terminal and by means of a first transistor connected as a diode to a first terminal at a reference potential and by means of a second transistor connected as a diode to a second terminal, means coupling a series arrangement of an input port for applying a signal voltage and a first resistor for converting the signal voltage into a signal current between the first and the second terminal, a third and a fourth transistor having bases coupled to the first and the second terminal, respectively, means connecting the emitters of the third and fourth transistors by means of a common second current source to the second supply terminal and wherein the collector of at least one of the third and fourth transistors forms an output for supplying an output current proportional to the signal current, and a correction circuit for correcting a non-linearity in the voltage-current conversion due to non-linear emitter resistors of the first and the second transistor, the correction circuit comprising a circuit having a first input terminal coupled to the first terminal and a second input terminal coupled to the second terminal, said correction circuit having a negative input impedance whose resistance is substantially equal to the resistance of the first resistor.

4,682,099

LOGARITHMIC POTENTIOMETER CIRCUIT

Claus Koken, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

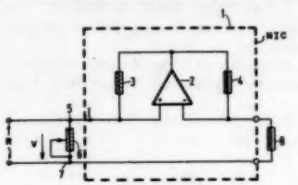
Filed Mar. 27, 1985, Ser. No. 716,771

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412532

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—63 **10 Claims**

1. A logarithmic potentiometer circuit comprising, an adjustable ohmic resistance element having a linearly adjustable ohmic resistance characteristic, means connecting said linearly adjustable ohmic resistance element in parallel with a bipolar circuit arrangement having a negative ohmic resistance value, and means connecting the parallel combination of the linearly adjustable resistance element and the negative resistance bipolar circuit to a pair of terminals at which an approximately logarithmic resistance characteristic is derived.



4,682,100

METHOD OF MEASURING A DC CURRENT OR A LOW-FREQUENCY AC CURRENT

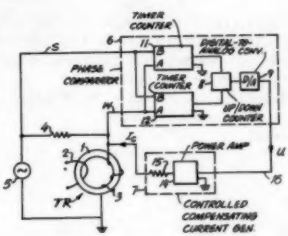
Frank H. Hagelin, Alvjso, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 626,876, Jun. 29, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,709

Claims priority, application Sweden, Dec. 21, 1982, 8207304; PCT Int'l Appl., Dec. 14, 1983, PCT/SE83/00450

Int. Cl.[4] G01R *19/10*

U.S. Cl. 324—117 R **4 Claims**

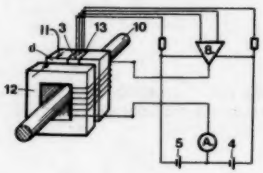


1. Method of measuring a DC or a low frequency AC current comprising the steps of providing a transformer with a core about which there is wound a primary and a secondary winding, feeding the current to be measured through the primary winding, whereby a first flux is generated in the transformer, generating a modulating voltage, phase shifting the modulating voltage, applying the phase shifted modulating voltage across the secondary winding, and with an amplitude so as to saturate the core, measuring separations in phase between the modulating voltage and the phase shifted modulating voltage at two consecutive zero passages, and feeding a compensating current of increasing amplitude through the secondary winding until a measured difference between the two separations in phase is zero, the amplitude of the compensating current at zero difference in separation in phase being a representation of the current to be measured.

4,682,101
CURRENT TRANSFORMER FOR DIRECT AND ALTERNATING CURRENT

Pierre Cattaneo, Collonges, France, assignor to Lem S.A., Geneva, Switzerland

Filed Jan. 24, 1986, Ser. No. 821,976
Claims priority, application Switzerland, Feb. 5, 1985, 00499/85
Int. Cl.[4] G01R *33/00, 19/00;* **G05F** *1/325;* **H01F** *40/06*
U.S. Cl. 324—117 H **3 Claims**



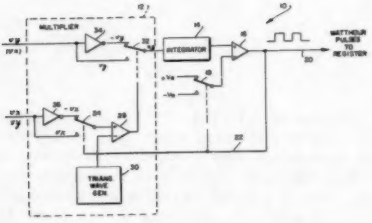
1. A current transformer for measuring direct and alternating currents in a conductor, comprising:

a magnetic circuit including a first ferromagnetic core and a second ferromagnetic core magnetically coupled to said first core, said cores being disposed about the conductor so that a magnetic field is induced in said cores by the current in said conductor, only said first core having an air gap and a Hall effect element positioned within said air gap for producing an electric signal dependent on the magnetic field induced in said first core, a winding wound about at least said first core, an amplifier connected to receive said electric signal as an input, said amplifier producing an output signal, means for applying said output signal to said winding in a direction tending to cancel the magnetic field induced in said cores by the conductor, and a current measuring device connected in series with said winding for measuring the current in said winding, which is proportional to the current in the conductor.

4,682,102
SOLID STATE WATTHOUR METER WITH SWITCHED-CAPACITOR INTEGRATION

Miran Milkovic, Schenectady, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Dec. 23, 1985, Ser. No. 812,369
Int. Cl.[4] G01R *11/02*
U.S. Cl. 324—142 **7 Claims**



1. An electronic watthour metering apparatus comprising:

means for producing a product signal responsive to an analog voltage related to one of a load voltage and a current said product signal being pulse-width modulated in relation to the other of said load voltage and current;

means for integrating said product signal;

a hysteresis comparator responsive to an integrated output of said means for integrating and effective for changing its output between first and second different voltages upon said integrated output attaining third and fourth different values;

said means for producing a product signal including means responsive to said first voltage for driving said means for integrating in a first direction and responsive to said second voltage for driving, said means for integrating in a second direction whereby an offset voltage is cancelled;

said means for integrating including;

an operational amplifier having a first capacitor connected between its output and its input;

a second capacitor connectable for charging by said product signal;

switching means for transferring an amount of charge related to said product signal into said second capacitor;

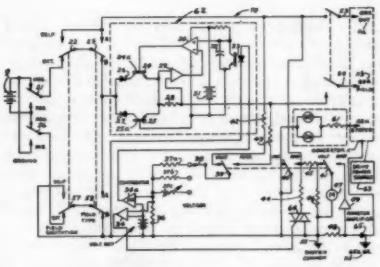
said switching means including means for applying said amount of charge to said input of said operational amplifier; and

a clock including means for driving said switching means between said transferring and said applying at a predetermined frequency, whereby a current proportional to said predetermined frequency and a ratio of capacitances of said first and second capacitors passes through said second capacitor to said input of said operational amplifier.

4,682,103
CIRCUITRY FOR TESTING GENERATOR OUTPUT

Nicholas F. DeNardis, Rte. 1, Box 209A, Greenwood, Wis. 54437

Filed Jul. 6, 1984, Ser. No. 629,205
Int. Cl.[4] G01R *31/00;* **H02K** *11/00*
U.S. Cl. 324—158 MG **1 Claim**



1. Means measuring the short circuit output current of a generator with an excitation voltage proportional to the rated output voltage of the generator, comprising

a circuitry including an ammeter in circuit with a generator,

an induced element of said generator being in series with the internal impedance of said generator and with said ammeter, short circuiting said generator,

said circuitry including an appropriate voltage source,

said voltage source providing an excitation voltage applied to the field of said generator,

means causing said excitation voltage to be a predetermined proportion of the rated voltage of said generator,

whereby the output current of said generator passes over said ammeter as a linear function proportional to said field excitation voltage,

said ammeter being calibrated to convert the reading of said current passing thereover into a direct reading of the full output current of said generator under load,

said circuitry including an absolute value comparator referenced to a common voltage source, and

a switch selectable attenuator in connection with said comparator monitoring the output voltage of said generator.

4,682,104
ANGULAR DISPLACEMENT PICKUP, PARTICULARLY FOR THE DETECTION OF TORQUE IN POWER STEERING

Claude Lombard, Le Chesnay; Jean-Paul Brisset, Thiais; Gérard Catier, Issy les Moulineaux; Jean-Luc Marais, Nanterre, and Gino Zammarchi, Chatou, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jul. 30, 1984, Ser. No. 635,494

Claims priority, application France, Jul. 29, 1983, 83 12511

Int. Cl.[4] G01B *7/14, 7/24*

U.S. Cl. 324—208 **14 Claims**

1. A contactless angular displacement apparatus for measurement of torque, comprising:

two coaxial disks electrically insulated from each other and having opposing faces which disks are each rotatable in relation to one another by an angle to be detected, wherein said disks carry on said opposing faces conductive plane coils with said coils being in the shape of spirally wound sectors coiled alternately in both directions and wherein the mutual induction of said coils varies as a function of the relative angular position of said disks;

at least one rotary transformer mounted coaxially with said disks;

circuit means for supplying the primary of one of said at least one rotary transformer with a high frequency signal input whereby the secondary of said one rotary transformer supplies an induction electromotive force to one of said disks; and

processing circuit means for processing signal indicating the induction electromotive force supplied by the other one of said disks.

4,682,105
APPARATUS FOR ELECTRICALLY CONTACTLESSLY MEASURING THE THICKNESS OF ELECTRICALLY CONDUCTING THIN FILMS ON NON-CONDUCTING TRAVELLING WEBS IN VACUUM DEPOSITION APPARATUS

Gernot Thorn, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

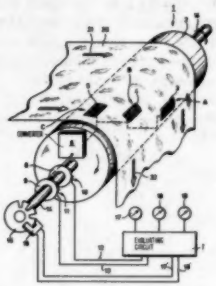
Filed Sep. 25, 1984, Ser. No. 654,762

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335766

Int. Cl.[4] G01B *7/08, 7/10;* **G01R** *33/12*

U.S. Cl. 324—230 **4 Claims**

1. Apparatus for electrically contactlessly measuring the thickness of electrically conducting thin films on non-conducting travelling webs in vacuum deposition apparatus comprising: at least one roller around which the webs runs, a plurality of individual sensors each with a circumferentially spatially limited measuring region with respect to the circumference of said roller for developing measurement signals which represent a measure for the film thickness, an evaluating circuit for the measurement signals, a converter for coupling said sensors in common to said evaluating circuit, in which measuring apparatus the sensors are arranged in the roller against its surface and are distributed lengthwise of the roller to rotate with the said roller and are coupled to the evaluating circuit, said roller having at least one position indicator for indicating the position of the sensors during the time in which the respective sensor and the web move in concentric circles, and said evaluating circuit having means coupled to said at least one position indicator for receiving from said position indicator a



position signal for each sensor and for evaluating the measurement signal in response to its respective position signal only for a defined angle of rotation in which the respective sensor and the web move in concentric circles.

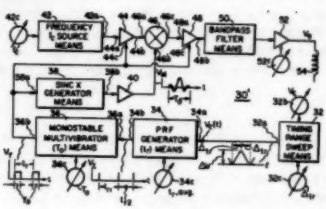
4,682,106
METHODS OF, AND APPARATUS FOR, PROTON DECOUPLING IN NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

Dimitrios Vatis, Schenectady; Paul A. Bottomley, Clifton Park, and Thomas H. Foster, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,405

Int. Cl.[4] G01R *33/08*

U.S. Cl. 324—307 **38 Claims**



21. Apparatus for providing a radio-frequency signal having at least one selected one of (1) first specie decoupling and (2) nuclear Overhauser enhancement effect, upon a second nuclei specie in a sample in a nuclear magnetic resonance (NMR) experiment, comprising:

means for providing a radio-frequency (RF) signal at a center frequency substantially equal to the Larmor frequency of a first specie, different from said second nuclear specie, in said sample;

means for modulating the amplitude of the RF signal with a time-dependent sinc ($\omega_0 t$) signal waveform;

means for adjusting at least one selected one of (1) the amplitude of the modulated radio-frequency signal and (2) the instantaneous center frequency, across a range of frequencies related to a chemical shift spectrum ω_0 of the first specie; and

means for applying the adjusted signal to the sample to cause at least one selected one of (1) minimization of the coupling of the first nuclear specie to, and (2) nuclear Over-

hauser enhancement of, magnetic resonance spectroscopy response signals provided by the second nuclear specie.

4,682,107

METHOD OF OPERATING A NUCLEAR MAGNETIC RESONANCE SPECTROMETER

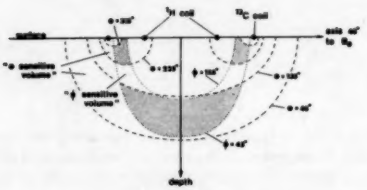
Max R. Bendall, 274 Ford Road, Burbank, Queensland, Australia (4123), and David T. Pegg, 7 Fanfare Street, 8 Mile Plains, Brisbane, Queensland, Australia (4123)

Filed Mar. 25, 1985, Ser. No. 715,244

Claims priority, application European Pat. Off., Mar. 29, 1984, 84103483.8

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **4 Claims**



1. A method of operating a nuclear magnetic resonance spectrometer in relation to a sample comprising two types of nuclear magnetic resonators, by applying to the sample a sequence of radiofrequency pulses and delay periods, the pulses thereof comprising radiofrequency bursts of two different radiofrequencies corresponding to the resonant frequencies of the two types of magnetic resonators, such that the scaler coupling interactions between the two types of magnetic resonators are allowed to evolve, characterized in that

pulses of rf bursts at one of the two radiofrequencies are applied to one of two spaced coils and pulses of rf bursts at the other radiofrequency are applied to the other coil, the two spaced coils being shaped and positioned to provide inhomogeneous rf fields in the sample to overlap sensitive volumes of their rf fields at a region of the sample so that NMR signal emission of greatest intensity will be obtained from the overlapping sensitive volumes.

4,682,108

MAGNETIC RESONANCE EQUIPMENT FOR THE PRODUCTION OF IMAGES OF A TEST OBJECT

Eckart Stetter, Erlangen; Helmut Reichenberger, Eckental; Siegfried Schneider, Erlangen, and Axel Wirth, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,535

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428391

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **10 Claims**

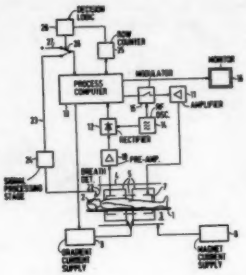
1. Apparatus for producing images of a test object using nuclear magnetic resonance, at least a portion said test object being subject to physical motion, said apparatus comprising:

(a) first means for applying magnetic primary and gradient fields to the test object and for detecting deflection of nuclear spins of the test object from their equilibrium position by a radio-frequency magnetic excitation pulse, said first means producing a plurality of time-sequential measurement signals representative of said nuclear spin deflection in response to a respective plurality of excitation pulses time-sequentially applied with corresponding gradient fields;

(b) second means, responsive to said produced measurement signals, for calculating an image of a cross-sectional slice of the test object by Fourier transformation from a matrix of Fourier rows, each Fourier row being calculated from at least one of said time-sequential measurement signals as a projection of the nuclear spins on a frequency axis caused by the plurality of magnetic field gradients in said slice;

(c) third means for generating a motion signal representative of said physical motion of said portion of the test object;

(d) fourth means, coupled to said second means, for counting Fourier rows; and



(e) fifth means, responsive to said fourth means and coupled to said second and third means, for controlling the calculation of said image such that said time-sequential measurement signals are continuously produced for use by said second means for the calculation of Fourier rows outside a predetermined region of the rows in said matrix, but are intermittently produced for use by said second means as a function of said motion signal when within said region.

4,682,109

METHOD AND DEVICE FOR DETERMINING AN NMR DISTRIBUTION IN A REGION OF A BODY

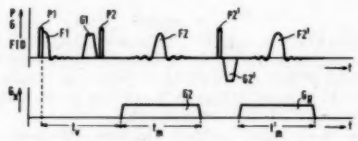
Johannes J. M. Cuppen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,557

Claims priority, application Netherlands, Nov. 29, 1984, 8403627

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **11 Claims**



11. An apparatus for producing an NMR image of a region of a body, said apparatus comprising means for generating a steady, uniform magnetic field, means for generating an RF electromagnetic pulse so as to cause precessional motion of nuclear spins in the body under examination disposed in said steady magnetic field to thereby generate a resonance signal, means for generating a gradient magnetic field, means for taking signal samples of said resonance signal, means for controlling said pulse generating means, said gradient field generating means and said sample taking means so that during a first measurement period in successive measurement cycles, a plurality of first signal samples are taken of said resonance signal which is conditioned by varying the intensity of said gradient field from measurement cycle to measurement cycle or by varying the time duration during which the body under examination is exposed to said gradient field, and so that during a second measurement period in at least some of said measurement cycles, a plurality of reference signal samples are taken of

said resonant signal which is non-conditioned, said reference signal samples being taken in the presence of a gradient field which is the same during said second measurement period of each measurement cycle during which said reference signal samples are taken, and means for forming, from said first signal samples and said reference signal samples, an NMR image of said region of said body being examined, said image forming means including means for using said reference signal samples to modify transformation of the first signal samples so as to reduce the effect on said image of movements of said body during examination thereof.

4,682,110

METHOD OF REDUCING ARTEFACTS IN IMAGES FORMED BY MEANS OF FOURIER ZEUGMATOGRAPHY

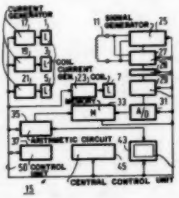
Johannes H. den Boef, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,707

Claims priority, application Netherlands, Mar. 5, 1984, 8400699

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **13 Claims**



12. A device for determining the nuclear magnetic resonance distribution in a region of a body, comprising:

(a) means for generating a steady, uniform magnetic field,

(b) means for generating a high-frequency electromagnetic excitation pulse so as to produce precessional motion of the magnetization of nuclei in the body thereby generating a resonance signal,

(c) means for generating at least one gradient magnetic field during a preparation period so as to condition said resonance signal,

(d) sampling means for sampling said resonance signal after conditioning thereof so as to obtain a set of n sample signals,

(e) processing means for processing said sample signals, and

(f) control means for controlling at least said radiation generating means, said gradient field generating means, said sampling means and said processing means so as to generate and sample a plurality of said resonance signals, each resonance signal being generated and sampled after conditioning thereof during a respective one of a plurality of measurement cycles which follow one another with a waiting period between successive cycles, the control means supplying the gradient field generating means with control signals for adjusting the intensity and/or the duration of at least one gradient magnetic field so that the integral of the intensity over the duration of said at least one gradient magnetic field is different after each waiting period,

the control means comprising programmed computer means for generating and applying further control signals to the pulse generating means in accordance with a programmed schedule so that said pulse generating means generates a pulse having either a first phase or a second phase during a measurement cycle, the second phase being shifted 180° with respect to the first phase, said device further comprising means for storing said sample signals obtained during successive measurement cycles so as to obtain a matrix of n' rows, each row of said matrix being comprised of n signal samples obtained during a respective one of said measurement cycles.

4,682,111

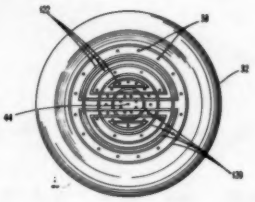
MAGNETIC RESONANCE IMAGING MAGNET

Simon H. C. Hughes, Garnee, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 5, 1985, Ser. No. 708,448

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 **12 Claims**



1. A magnet for use in a magnetic resonance imaging device, comprising:

a. first and second pole pieces of magnetically conductive material;

b. first and second coils located around said first and second pole pieces, respectively, to generate a magnetic field between said pole pieces when said coils are energized;

c. additional magnetically conductive material arranged to provide a closed loop magnetic flux return path for said pole pieces; and wherein

d. said pole pieces each include means for uniformly distributing said magnetic field between said pole pieces comprising an exposed surface on each of said pole pieces spaced apart from one another with each said exposed surface having a toroidal portion and a central concave portion surrounded by said toroidal portion, said toroidal portion smoothly transitioning to said central concave portion and said central concave portion comprising a smooth concave indent in said exposed surface.

4,682,112

NMR ANTENNA AND METHOD FOR DESIGNING THE SAME

Steve Beer, Burlington, Mass., assignor to Elscint Ltd., Haifa, Israel

Filed Oct. 10, 1984, Ser. No. 659,457

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 **34 Claims**

1. An antenna system for nuclear magnetic resonance (NMR) imaging or spectroscopy comprising:

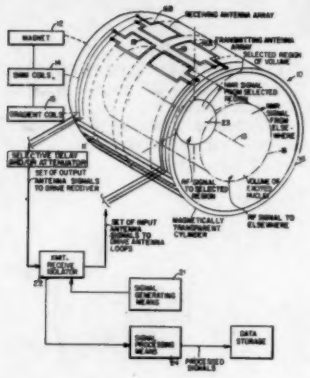
(a) means to transmit radio-frequency (RF) signals for exciting nuclei in a volume of an object positioned in a substantially uniform magnetic field whose strength is functionally related to the frequency of the RF signal;

(b) a receiving antenna array comprising a group of loop antennas operatively associated with the object for receiving signals from said volume of the object, each loop antenna in said array producing a separate output signal; and

(c) signal processing means for processing said output signals to produce processed signals;

(d) said signal processing means being constructed and arranged to control the relative phases and amplitudes of each of said separate output signals during processing

such that the contribution to said processed signals from signals emanating from a selected region of said volume is



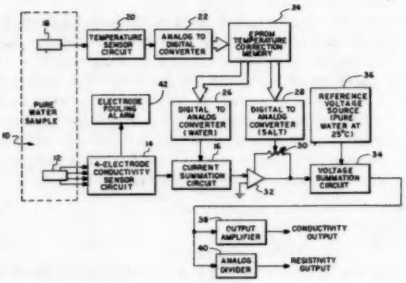
significantly greater than the contribution from signals emanating from elsewhere in said volume.

4,682,113

PURE WATER CONDUCTIVITY SENSOR

Theodore R. Barben, II, Carson City, Nev., assignor to TBI, Carson City, Nev.

Filed Dec. 3, 1985, Ser. No. 804,217
Int. Cl.[4] G01R 27/22
U.S. Cl. 324—441 **10 Claims**



1. A system for measuring conductivity of a high purity water sample comprising:

a total conductivity measuring means having a multiple electrode probe immersed in said sample for generating a total conductivity signal proportional to the total conductivity of the sample;

a temperature sensing means for generating a temperature output indicative of the temperature of the sample;

first compensation means responsive to the temperature output from the temperature sensing means for generating a pure water correction signal corresponding to the conductivity of absolutely pure water at the temperature of the sample;

first summation means for subtracting the pure water correction signal generated by the first compensation means from the total conductivity signal generated by the conductivity measuring means to produce a net conductivity signal indicative of the conductivity value of salt impurities in the sample;

second compensation means for generating a salt correction signal corresponding to the ratio between the conductivity of the salt at the measured temperature as compared with a standard reference temperature;

amplifier means responsive to the salt correction signal for adjusting the net conductivity signal applied to its input to produce an adjusted salt conductivity output proportional to the conductivity of the salt at a standard reference temperature;

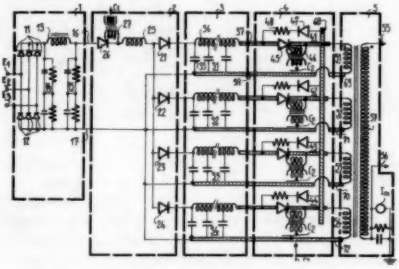
second summation means for adding the adjusted salt conductivity output to a fixed amplitude signal, which corresponds to the conductivity of absolutely pure water at the standard reference temperature, to produce a combined output signal corresponding to the total conductivity of the sample being measured at the standard reference temperature.

4,682,114

POWER MODULATOR PROVIDED WITH A TRANSFORMER

Jeanne Aucouturier, L'Hay-Les-Roses; Hubert Leboutet, St. Cloud, and Jean-Louis Pourre, Chatillon-Sous-Bagneux, all of France, assignors to CGR/MEV, Buc, France

Filed Apr. 13, 1984, Ser. No. 599,818
Claims priority, application France, Apr. 15, 1983, 83 06223
Int. Cl.[4] H03K 3/86, 3/00; H03L 5/00; H01F 27/28
U.S. Cl. 328—67 **11 Claims**



1. Power modulator equipped with a transformer to receive electrical impulses produced by an impulse generator stage and to produce higher voltage electric impulses, wherein the said transformer is one of the armoured type and comprises a certain number of primary windings connected in parallel to said impulse generator stage through distribution elements, these primary windings being wound about the secondary winding of this transformer, said primary windings each being connected to said distribution elements by a pair of conductor wires connected to opposite ends of the primary windings which are brought close together to reduce inductive losses.

4,682,115

APPARATUS FOR REGENERATING ORIGINAL SIGNALS

Seiichi Mita, Tsukui; Morishi Izumita, Inagi; Yuichi Michikawa, Katsuta; Hitoshi Katayama, Nerima; Hiroshi Shiono, Mito; Hitoshi Takagi; Morito Rokuda, both of Katsuta, and Nobukazu Doi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

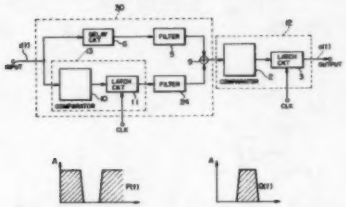
Filed Jun. 10, 1985, Ser. No. 742,792
Claims priority, application Japan, Jun. 11, 1984, 59-119487
Int. Cl.[4] H03K 5/00, 5/01
U.S. Cl. 328—164 **6 Claims**

1. An apparatus for regenerating an original digital signal which is applied to a system which cuts off a predetermined frequency band component in the original digital signal and outputs the remaining signal components, comprising:

first means responsive to the output of said system for gener-

ating from said output signal of said system a first signal corresponding to the predetermined frequency band component which has been cut off by said system;

second means responsive to the output of said system for outputting a second signal which is obtained by delaying the output signal of said system by a time that corresponds to the time a signal is delayed by said first means;



third means connected to said first and second means for adding said first and second signals and for outputting a signal representing the addition result thereof; and

fourth means connected to said third means for digitizing said output signal of said third means so as to regenerate said original digital signal.

4,682,116

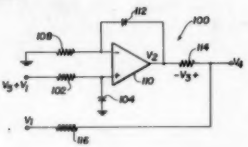
HIGH SPEED PHASE LOCKED LOOP FILTER CIRCUIT

Dan H. Wolaver, Worcester, Mass., and Warren E. Little, Salem, N.H., assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 474,489, Mar. 11, 1983, Pat. No. 4,547,747. This application Aug. 1, 1985, Ser. No. 761,355

Int. Cl.⁴ H03K *5/00*; **H03B** *1/00*

U.S. Cl. 328—167 **2 Claims**



1. A loop filter means, for use in a phase locked loop circuit having reference signal generating means, and having frequency comparison means and phase comparison means which produce input signals for said loop filter means, comprising:

operational amplifier means having inverting and noninverting inputs, output and integrating feedback means for noninvertingly integrating input signals from said frequency and phase comparison means, said input signals being connected to said non-inverting input;

said integrating feedback means comprising feedback capacitor means connecting the output of said operational amplifier means to the inverting input of said operational amplifier means;

second capacitor means connecting the noninverting input of said operational amplifier means to a reference potential;

voltage divider means having first and second inputs and an output, the output of said operational amplifier means being connected to said first input of said voltage divider means and selected inputs from one of said input signals being connected at said second input of said voltage divider means, said voltage divider means attenuating and summing said output of said operational amplifier means and said selected input signal to provide an output signal of said loop filter means at said output of said voltage divider means.

4,682,117

QUADRATURE DEMODULATION DATA RECEIVER WITH PHASE ERROR CORRECTION

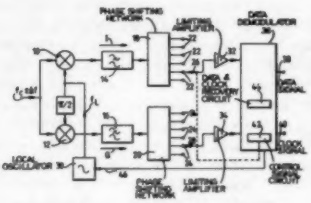
Rodney W. Gibson, Burgess Hill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 662,861, Oct. 19, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 858,849

Claims priority, application United Kingdom, Oct. 21, 1983, 8328162

Int. Cl.⁴ H03D *3/00*

U.S. Cl. 329—50 **6 Claims**



5. A data receiver comprising quadrature mixers having outputs coupled by signal paths to a coherent data demodulator, means for applying an incoming signal to each of said mixers, low pass filter means in each of said signal paths, and means for correcting phase errors after the outputs from the mixers have been low pass filtered in said filter means, the data demodulator including means for determining the phase error in the incoming signal and producing a control signal in response to the phase error determined;

wherein said correcting means includes phase shifting networks in said signal paths to the data demodulator, and said receiver further comprises means for using said control signal to determine a phase correction to be applied to said phase shifting networks.

4,682,118

PHASE SHIFT KEYING AND PHASE MODULATION TRANSMISSION SYSTEM

David V. Thiel, Rochedale, Australia, assignor to Griffith University, Brisbane, Australia

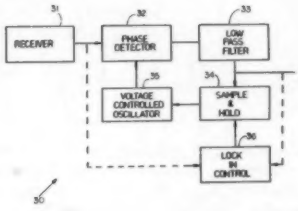
PCT No. PCT/AU84/00262, § 371 Date Sep. 16, 1985, § 102(e) Date Sep. 16, 1985, PCT Pub. No. WO85/02966, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 19, 1984, Ser. No. 770,287

Claims priority, application Australia, Dec. 22, 1983, PG2964

Int. Cl.⁴ H03D *3/00*

U.S. Cl. 329—122 **6 Claims**



1. A phase demodulator including:

a receiver means for receiving a modulated signal transmitted by a transmitter; and

a modified phase locked loop adapted to receive the modulated signal from the receiver means, said phase locked loop including a phase detector for receiving the modu-

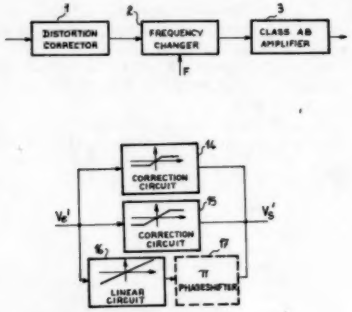
lated signal, a low pass filter receiving an output from the phase detector, a voltage controlled oscillator providing a controlled input to the phase detector, a sample and hold circuit for receiving the output from the filter and providing a control signal for the voltage controlled oscillator and lock-in control means deriving a lock control signal from at least one of the modulated signals and the output of the filter to provide a lock-in control signal for the sample and hold circuit whereby in use when the lock-in control signal to the sample and hold circuit is high the phase locked loop locks onto the modulated signal and when the lock-in control signal is low the sample and hold circuit output is fixed independent of the filter output and if there is no change in the phase or frequency of the modulated signal the phase locked loop remains locked and the output of the sample and hold circuit approximates the output of the filter although the connection between the filter and sample and hold circuit is blocked and if a change in phase or frequency of the modulated signal occurs then the difference between the sample and hold circuit and the filter outputs is proportional to the phase or frequency shift in the modulated signal, and said lock-in control means including a divider and one shot in series, said divider receiving the modulated signal and the output of the one shot providing the lock-in control signal.

4,682,119

CLASS AB AMPLIFIER AND A DISTORTION CORRECTOR THEREFOR

Jean Michel, Trappes, France, assignor to Thomson -CSF, Paris, France

Filed Jan. 27, 1986, Ser. No. 822,834
Claims priority, application France, Jan. 25, 1985, 85 01081
Int. Cl.[4] H03F *1/32*
U.S. Cl. 330—149 **2 Claims**



1. A class AB amplifier including a distortion corrector, the corrector comprising a trough corrector, the quiescent current of the amplifier being chosen so that the characteristic $Vs=f(Ve)$ of the amplifier, where Ve and Vs are respectively the input and output voltages of the amplifier has a monotonic variation drift,

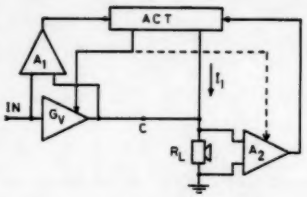
and wherein the characteristic $Vs'=f(Ve')$ of the trough corrector where Ve' and Vs' are respectively the input and output voltages of the trough corrector has a concavity which increases in absolute value of slope towards increasing absolute values of Vs'.

4,682,120

SHORT CIRCUIT PROTECTION DEVICE FOR AN INTEGRATED CIRCUIT AND A LOAD CONNECTED THERETO

Sergio Palara, Bareggio, and Aldo Torazzina, Monza, both of Italy, assignors to SGS Microelettronica S.p.A., Milan, Italy

Filed Sep. 27, 1984, Ser. No. 655,338
Claims priority, application Italy, Sep. 27, 1983, 23003 A/83
Int. Cl.[4] H03F *21/00*
U.S. Cl. 330—298 **20 Claims**



12. The method of protecting an amplifier circuit driving a load impedance comprising the step of;

deactivating said amplifier circuit and applying a preselected current to said load impedance in response to a first amplifier condition; and

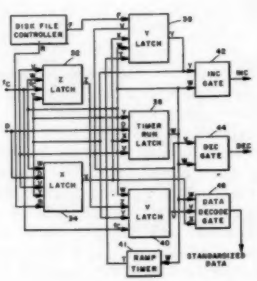
activating said amplifier circuit and halting said current in response to a first impedance condition.

4,682,121

PHASE DISCRIMINATOR AND DATA STANDARDIZER

Dale B. Chapman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,105
Int. Cl.[4] H03L *7/02;* H03D *3/18*
U.S. Cl. 331—1 A **20 Claims**



1. An apparatus, responsive to the difference in phase between an input data signal having transitions and a variable-frequency clock signal having transitions, for producing a phase correction signal to change the frequency of said clock signal, comprising:

reference timing means responsive to an input data signal having transitions for producing a timing reference signal having a predetermined reference timing period;

multi-variable circuit means responsive to said reference timing signal and to a transition of a variable-frequency clock signal for measuring a phase difference between said input data and clock signals by producing and changing a

plurality of variable signals in a sequence defining a multi-state transition cycle in which each transition between adjacent states is determined by the change in one respective variable and for producing phase difference signals indicative of said measured phase difference; and

gate means responsive to said phase difference signals for producing a phase correction signal to change the frequency of said reference clock signal.

4,682,122

FREQUENCY SYNTHESIZER STAGE ADDING HIGH FREQUENCY STEPS TO AN INITIAL FREQUENCY

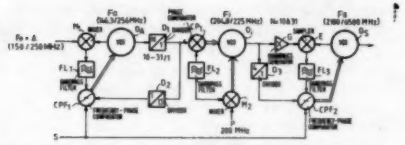
Joël Remy, Paris, and Roger Charbonnier, Meudon Bellevue, both of France, assignors to Adret Electronique, Trappes, France

Filed Oct. 15, 1985, Ser. No. 786,975

Claims priority, application France, Jun. 1, 1984, 84 08650

Int. Cl.⁴ H03L *7/18*

U.S. Cl. 331—2 **4 Claims**



1. A frequency synthesizer for generating an output frequency Fs by adding large frequency steps to a frequency itself comprising smaller frequency steps and comprising first and second circuits, each of said circuits including at least one current or voltage controlled oscillator controlled by a phase lock loop, the first circuit dividing, by means of a programmable divider, the input frequency Fo+Δ (Δbeing the sum of the small steps) by a rational division factor and adding to the result of this division a standard frequency P which is in a fixed integral ratio with the large steps so as to give an intermediate frequency Fi, while the second circuit multiplies the said intermediate frequency by the said rational factor, wherein the second circuit divides the intermediate frequency Fi by a fixed integral ratio D and compares the result Fi/D of the division to a beat between the output frequency Fs and a harmonic N. Fi of the intermediate frequency, while the said rational factor is N+1/D.

4,682,123

DIGITAL VOICE AND DATA FREQUENCY MODULATION CIRCUIT

Roger K. Loper, Norway, and Richard A. Freeman, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 11, 1986, Ser. No. 873,241

Int. Cl.⁴ H03C *3/00*

U.S. Cl. 332—16 R **18 Claims**

17. In a frequency modulation system:

means for providing a data signal;

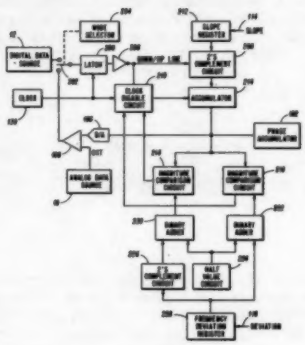
means for selectively providing a slope value;

first means for providing a signal indicative of an increase in the amplitude of the data signal;

second means for providing a signal indicative of a decrease in the amplitude of said data signal;

means for accumulating the slope value responsive to said first means and accumulating the negative of said slope value responsive to said second means;

means for disabling the accumulating means when the accumulated value exceeds a predetermined maximum level or subceeds a predetermined minimum value; and



means for generating a signal whose frequency is dependent upon the value in the accumulating means.

4,682,124

CIRCUIT INCLUDING A DC-FM PHASE LOCKED LOOP

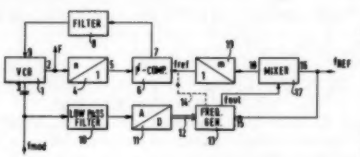
Johann Schutz, Munich, Fed. Rep. of Germany, assignor to Schlumberger Messgerate GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,477

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3433222

Int. Cl.⁴ H03C *3/06*

U.S. Cl. 332—19 **5 Claims**



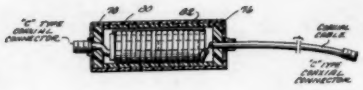
1. A circuit including a DC-FM phase locked loop, the circuit comprising a variable frequency oscillator having a control input for a modulation signal, a frequency divider connected between the output of said oscillator feeding one input of a phase comparator, a second input of said phase comparator being connected to receive a reference frequency, and the output of said phase comparator being connected, via a filter, to a frequency control input of said oscillator, wherein a quartz-stabilized but frequency-variable frequency generator is provided for the generation of said reference frequency, and wherein said modulation signal is fed via a low pass filter to the input of an analog-to-digital converter for conversion to corresponding digital signals, which are fed to control inputs of said frequency generator so as to cause the output reference frequency produced by said generator to fluctuate, in response to low frequency and DC components of said modulation signal, by substantially the same amount as the output frequency of said frequency divider.

4,682,125

RF COIL COUPLING FOR MRI WITH TUNED RF REJECTION CIRCUIT USING COAX SHIELD CHOKE

William H. Harrison, Malibu; Mitsuaki Arakawa, Hillsborough, and Barry M. McCarten, Piedmont, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 10, 1986, Ser. No. 827,638
Int. Cl.[4] H03H 7/01
U.S. Cl. 333—12 6 Claims



1. A coaxial cable RFI choke assembly for reducing transmission, via the outside of the outer coaxial conductor, of RF signals having a predetermined frequency while passing RF signals of the same predetermined frequency on the inside of said coaxial conductor, said assembly comprising:

a coiled section of coaxial cable having an outer conductive member and including plural coil turns between first and second coil ends which cable, insofar as the outer conductive member is concerned, provides inductance L;

a lumped fixed capacitor of capacitance C physically disposed transversely across one of said coil ends and electrically connected in parallel across both of said coil ends, said inductance L and capacitance C presenting a parallel resonant circuit approximately at said predetermined frequency which substantially impedes the flow of said RF signals via the outside of the outer conductive member;

a conductive tuning rod positioned within the center of said coiled section so as to achieve parallel resonance of the assembly substantially at said predetermined frequency;

adhesive material fixing said tuning rod and coiled section of coaxial cable in place relative one another;

a forming cylinder of insulationg material with said coiled section of coaxial cable being wound thereonto and having a cavity in its center section into which said tuning rod is located; and

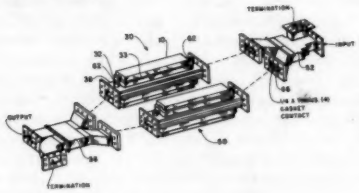
a cylindrical housing, closed on each end, encapsulating said assembly, having a coaxial cable input connection disposed at one end of the housing and a coaxial cable output connection disposed at the other end of the housing.

4,682,126

ELECTROMAGNET FOR PROGRAMMABLE MICROWAVE CIRCULATOR

Walter E. Milberger, Severna Park; Joel R. Cohen, Silver Spring, and Leonard Dubrowsky, Owings Mills, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 1, 1984, Ser. No. 616,347
Int. Cl.[4] H01P 1/18, 1/22; H01F 27/34
U.S. Cl. 333—81 B 4 Claims



1. An electromagnet structure for a high-power variable attenuator using a programmable microwave circulator, wherein the circulator comprises input power divider means which divides input RF power to two phase shifters, and an output hybrid coupler between the two phase shifters and an output RF port to recombine the power, the power form the input power divider means to the two phase shifters having the same relative phase and the same amplitude, the two phase shifters being controlled to introduce a relative phase shift, the two phase shifters being designed to operate from zero to 90° phase shift to achieve minimum to maximum attenuation characteristics;

wherein each of said phase shifters comprises a waveguide section having ferrite slabs mounted on interior walls, and the electromagnet structure forms a yoke for each phase shifter, comprising core means for each phase shifer with winding means on part of the core means, the core means having pole faces adjacent opposite outer surfaces of the waveguide means, so that there is an air gap between the pole faces, the ferrite slabs being located in the air gap to be biased by the magnetic flux;

wherein the core means includes laminations of magnetic material having a high permeability, with a magnetic path having a first portion through the magnetic material and a second portion through the air gap, so that the effective length of the magnetic path is equal to the sum of first and second terms, the first term being the length of the first portion and the second term being equal to said permeability multiplied by the length of the second portion, the second term being very large such that the first term is insignificant and therefore the flux density is substantially equal to ampere turns supplied by said winding means divided by the length of the air gap, and the permeability required is much smaller than the permeability of the magnetic material;

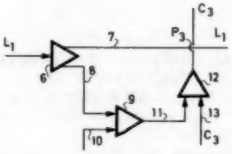
wherein said core means further includes a non-magnetic filler forming spacers between said laminations, the laminations being relatively thin and the spacers comparatively thick so that the resulting average permeability is sufficient to provide said required phase shift.

4,682,127

ULTRA-HIGH FREQUENCY SIGNAL SWITCHING MATRIX HAVING ACTIVE COMPONENT SWITCHING JUNCTIONS

John Magarshack, Reuil Malmaison, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 14, 1984, Ser. No. 640,804
Claims priority, application France, Aug. 17, 1983, 83 13391
Int. Cl.[4] H04Q 1/00
U.S. Cl. 333—103 15 Claims



1. A matrix for switching ultra-high frequency electrical signals from a first plurality of input channels or rows towards a second plurality of output channels or columns, the transfer of a signal from a respective input channel to a respective output channel being carried out at a switching point, said switching matrix being characterized in that each switching point comprises:

a power divider, whose input receives the signal transferred by a respective input channel and which supplies at its output a signal divided into a plurality of equal signals,

a controllable switch, controlled by an external signal,

which transfers at least one output signal coming from the divider to a power combiner, the combiner transmits the signal transmitted by the switch to a respective output channel, the system constituted by the power divider, the controllable switch and the power combiner being realized by active components of field effect transistor type.

4,682,128

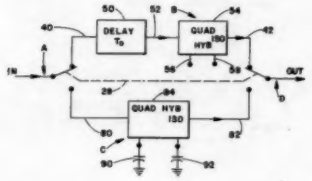
PHASE SHIFTER

Robert W. Sproul, 309 Parkside Rd., Harrington Park, N.J. 07640, and Michael F. Ponzo, 417 Marven Ave., Hackensack, N.J. 07601

Filed Jan. 22, 1986, Ser. No. 820,998

Int. Cl.[4] H03H *7/20;* **H01P** *1/18*

U.S. Cl. 333—139 **20 Claims**



1. A phase shifter system comprising:

a first path including:

(a) a first path input,

(b) a delay, with a delay input and a delay output,

(c) a first quadrature hybrid, with a first input port, a first output port at an isolated port to the input port, and a first non-isolated port to the input port, and

(d) a first path output, with the first path input, the delay, the first quadrature hybrid, and the first path output being in series electrical connection; and

a second path, selectively connectable electrically to, and in parallel with, the first path, the second path including:

(a) a second path input,

(b) a second path output, and

(c) a second quadrature hybrid, with a second input port electrically connected with the second path input, a second output port at an isolated port to the input port electrically connected with the second path output, and a second non-isolated port to the input port; and

a reactive load means for determining a system phase shift, the reactive load means being electrically connected to one of the first and second non-isolated ports of the quadrature hybrids.

4,682,129

THICK FILM PLANAR FILTER CONNECTOR HAVING SEPARATE GROUND PLANE SHIELD

Frank C. Bakermans, Raleigh, N.C., and Charles J. Trexler, York, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 480,592, Mar. 30, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,369

Int. Cl.[4] H01P *13/648*

U.S. Cl. 333—184 **5 Claims**

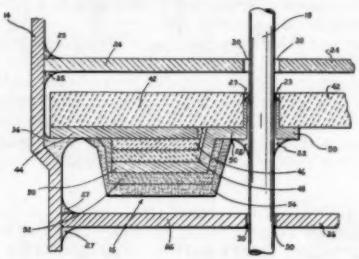
1. In an electrical connector for filtering a wide band of frequencies

comprising a conductive housing enclosing a planar filter member having opposed surfaces and at least one row of conductive pins extending through the opposed surfaces;

the filter member comprising multiple capacitors, there being a capacitor associated with each pin;

each capacitor having at least one conductive layer forming a ground electrode in electrical contact with the housing, at least one conductive layer forming a pin electrode in electrical contact with its respective pin and dielectric material separating the electrodes, the ground electrode being common to all pins in a row and being an elongated conductive layer along one side of the row of pins;

the improvement comprising at least one ground plane disposed over at least one surface of the filter member, the ground plane having peripheral edges in electrical contact with the housing and holes for accommodating the conductive pins without touching the pins, and the further improvement wherein the conductive layer forming the ground electrode, the conductive layer forming the pin electrode, and the dielectric material separating the electrodes are formed by screen printing alternate conductive and dielectric thick film layers on an alumina substrate.



4,682,130

FILTER FUNCTIONING WITH ACOUSTIC WAVES

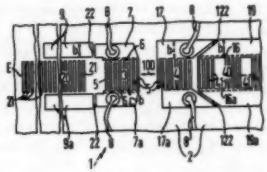
Wolf-Eckhart Bulst, Vaterstetten; Gertrud Lindemann, and Peter Zibis, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 27, 1985, Ser. No. 813,827

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501567

Int. Cl.[4] H03H *9/145, 9/64;* **H01L** *41/04*

U.S. Cl. 333—195 **7 Claims**



1. An electric acoustic wave filter, comprising:

a substrate having at least one electrically conductive transducer structure formed of finger-like portions and a large-area pad connecting to the finger-like portions on each side of the transducer structure, said large-area pads having leads connected thereto and having a substantially larger width in a direction perpendicular to wave propagation through the transducer structure as compared to a width of busbars which would connect the respective finger-like portions if a large-area pad was not required for connecting with a lead;

at least one reflector structure arranged directly next to the transducer structure, said reflector structure having a plurality of finger-like portions arranged for reflection of waves travelling along the wave propagation direction;

an auxiliary coating running along the wave propagation direction at both sides of the reflector structure and adjacent ends of the finger-like portions thereof, said auxiliary coatings having a width in said direction perpendicular to the wave propagation direction approximately the same as

said width of the respective large-area pads, said auxiliary coatings extending along at least that portion of the reflector structure in the direction of wave propagation which is essential for functioning of reflection by said structure; and

said auxiliary coatings being electrically separated from said respective large-area pads by a relatively small interruption compared to a length of said large-area pads in the wave propagation direction,

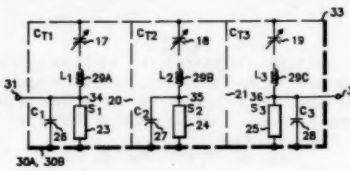
whereby said auxiliary coatings provide exposure compensation during an exposure of the digital structures during manufacture of the finger-like portions since said widths of said auxiliary coatings correspond to the respective widths of the large-area pads so that a substantially same over-shooting occurs in regions of said reflector structure as occurs in regions of said transducer structure.

4,682,131

HIGH-Q RF FILTER WITH PRINTED CIRCUIT BOARD MOUNTING TEMPERATURE COMPENSATED AND IMPEDANCE MATCHED HELICAL RESONATORS

Colin J. May, Sassafras, Australia, assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 7, 1985, Ser. No. 742,502
Int. Cl.[4] H01P *1/20*
U.S. Cl. 333—202 **13 Claims**



1. An improved, temperature compensated, bandpass helical filter arrangement exhibiting a given input impedance and a given output impedance and wherein the frequency range of interest of the filter may be changed as desired, said filter arrangement including in combination:

a modified ground plane having a dielectric layer with a plurality of segments formed thereon, each segment forming microstrip transmission line means configured to have a low impedance end and a high impedance end;

a plurality of helical resonators, each helical resonator having one end thereof coupled to the high impedance end of a respective one of said microstrip transmission line means;

a plurality of capacitor means, each capacitor means respectively connected in parallel with an associated one of said microstrip transmission line means between the high impedance end and low impedance end thereof; and

conductor means coupled to at least two of said microstrip transmission line means at the high impedance ends, respectively forming an input and an output for said helical filter arrangement,

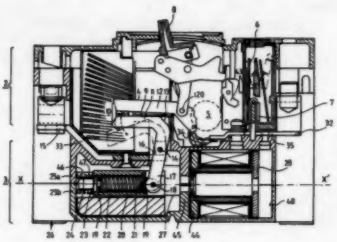
said capacitor means providing temperature compensation for said helical filter arrangement and said microstrip transmission line means having an electrical length less than one-quarter wavelength for the frequency range and having a configuration predetermined in accordance with a thickness and dielectric constant associated with the dielectric layer of the modified ground plane for providing an inductive impedance, which, in combination with said capacitor means, provides combined reactances to effect a desired impedance match to said helical resonators from the input or the output, as well as further determining the selected frequency range of the filter.

4,682,132

REMOTE CONTROL CIRCUIT BREAKER HAVING A RETRACTABLE SWITCH CONTACT

Elie Belbel, Epinay sur Seine; Christian Bataille, Ville d'Avray; Christian Blanchard, Rueil Malmaison; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

Filed Jan. 21, 1986, Ser. No. 820,297
Claims priority, application France, Nov. 15, 1985, 85 17209
Int. Cl.[4] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—14 **8 Claims**



7. A circuit breaker comprising:

i. at least one switch means having a closed and an open position, said switch means comprising:

a first bent pivoting lever having first and second arms connected together by a bent portion, said first arm having a contact end provided with a first contact and a second arm having a coupling end, said first pivoting lever being pivotally mounted about a pivoting axis placed between said bent portion and said coupling end;

a second pivoting lever which comprises a third arm having a contact end provided with a second contact adapted to cooperate with the first contact, said third arm facing said first arm and extending substantially parallel thereto when said first contact is applied against said second contact in said closed position, and said first and second pivoting levers being adapted so that the first contact opens with a sliding movement over the second contact;

ii. tripping means acting on said second lever for causing rapid opening of the second contact;

iii. at least a current detector for tripping said tripping mechanism when an excessive overcurrent is flowing through said switch means;

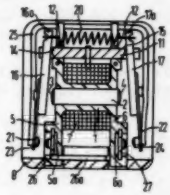
iv. an electromagnetic actuating means comprising a mobile element movable in translation under the effect of a control signal applied to said actuating means and means for transmitting the movement of the mobile element to the first pivoting lever, said transmission means, rigid and movable in translation parallel to the axis of movement of the mobile element being coupled to said coupling end of said pivoting lever in a position thereof which is centered on said axis,

wherein said transmission means comprise a stirrup piece, mounted for pivoting at the coupling end of said first pivoting lever and between the legs of which is placed a compression spring which bears on a cross piece carried by an insulating slider having a housing for guiding the stirrup piece parallel to said movement of the mobile element and rigid connection means between said slider and said mobile element, said cross piece being disposed so as to come into abutment against the first pivoting lever for causing opening of the first contact when said mobile element is actuated and for being moved by said first pivoting lever while compressing the spring without moving the slider when the first contact opens under the effect of said repulsion forces.

4,682,133
ELECTRO-MAGNETIC RELAY HAVING TWO ARMATURES

Josef Kern, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,827
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529158
Int. Cl.[4] H01H 67/02
U.S. Cl. 335—119 **9 Claims**



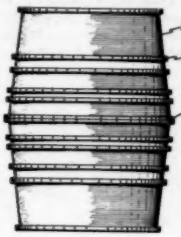
1. An electro-magnetic relay, comprising:
a coil having a coil body defining a mounting plane and an axially extending core extending parallel to the mounting plane and a winding around said core;
a yoke disposed adjacent said coil and parallel to said axis and having a bearing blade at each of first and second opposite ends;
first and second flat armatures extending substantially perpendicular to said axis at respective opposite ends of said coil, each of said flat armatures being seated on one of said bearing blades at one of said opposing yoke ends and forming a working air gap with an end of said core, each of said first and second flat armatures having a continuation extending beyond said bearing blade;
a common restoring spring stressed for tension connecting said continuations of said first and second armatures behind said bearing blades;
a contact spring carried by each of said first and second armatures;
movable contact elements on said contact springs;
an electrical conductor element connecting said movable contact elements on said two contact springs; and
cooperating contact elements for interaction with said movable contact elements,
whereby said first and second armatures are independently openable to form a two contact series connection relay.

4,682,134
CONICAL, UNIMPREGNATED WINDING FOR MR MAGNETS

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,921
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 **9 Claims**

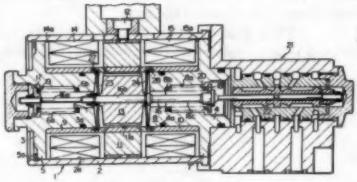
1. A winding for use in a cryostat of a superconductor magnet comprising:
a form comprising a shell having the shape of two truncated cones joined at their respective bases; and
superconducting wire wound circumferentially around said form under sufficient tension so that during superconducting magnet operation said form remains under compression.



4,682,135
ELASTIC SUPPORT MEMBERS FOR AN ELECTRIC ACTUATOR

Tsuyoshi Yamakawa, Fuwa, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Apr. 1, 1986, Ser. No. 846,738
Claims priority, application Japan, Apr. 3, 1985, 60-70440
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—256 **1 Claim**



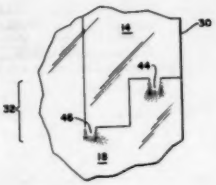
1. An electric actuator comprising
a housing,
a permanent magnet disposed within said housing,
an axially movable armature disposed within said housing,
an actuating coil supported by said housing for driving said armature to axially move, and
an axially moveable actuating rod fixedly connected to said armature, wherein said electric actuator further comprises
a pair of elastic support members having radially inner end portions fixedly connected to said actuating rod at opposite portions thereof adjacent said armature and radially outer end portions fixedly connected to said housing, respectively, each of said elastic support members consisting of a plurality of thin leaves laminated one upon the other, each of said elastic support members being formed with a plurality of arm portions equiangularly spaced apart with respect to one another and radially extending between said radially inner and outer end portions and a plurality of generally triangular openings each disposed between two adjacent arm portions, each of said arm portions being axially deflected with respect to said radially inner and outer end portions of said elastic support member.

4,682,136

FUSED COVERING FOR AN ELECTRICAL CONDUCTOR AND METHOD FOR MAKING THE FUSED COVERING

Raymond A. Prokop, Ingleside, Ill., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Nov. 26, 1985, Ser. No. 801,724
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—282 18 Claims



1. For an electrical assembly of the type having an electrical conductor disposed on the interior and a protective cover which includes a first wall and a second wall that engages the first wall, the improvement which comprises:

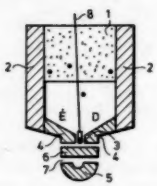
a first wall having a continuous seal lip extending from the wall, the lip having at least two surfaces in the uninstalled condition which are melted such that the lip is partially melted in the installed condition and is substantially fused with the second wall such that the leakage of fluids between the walls is blocked.

4,682,137

MAGNETIZING APPARATUS FOR THE MAGNETIZATION OF KEYS AND ROTORS OF MAGNETIC SAFETY LOCK SYSTEMS

Tibor Kasza; Gyula Kákonyi; Illés Kócso; Attila Buzás, and László Radványi, all of Budapest, Hungary, assignors to Elzett Muvek, Budapest, Hungary

Filed Sep. 18, 1985, Ser. No. 777,208
Claims priority, application Hungary, Sep. 28, 1984, 3679/84
Int. Cl.[4] H01F 7/20
U.S. Cl. 335—284 5 Claims



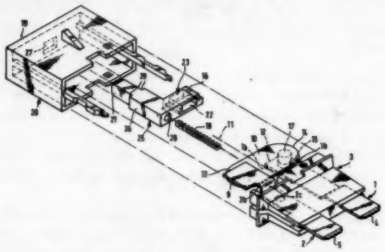
1. Magnetizing apparatus for the magnetization of magnetic blades to be journalled into two sides of the shank of a key for magnetic safety locks by means of surface magnetization with coded orientation, comprising an exciting magnet, magnetic flux-conducting soft iron members having tapering shanks connected with the poles of the exciting magnet of the apparatus and an air-gap formed between the ends of the shanks of the magnetic flux-conducting soft iron members, wherein the exciting magnet of the apparatus is a permanent magnet made of intermetallic compounds of rare earth metals of shell *4f* and transition metals of shell *3d* produced by means of powder metallurgy or casting, the rare earth metal consisting of at least one of Sm, Pr, Nd, Y, Gd, La, Dy, Eu, Yb, Er and Ce and the transition metal consisting of at least one of Fe, Co and Ni for improving the magnetic properties of the material; and wherein at least portions of said soft irons contiguous to said air gap are made of a material of high magnetic saturation value, e.g. an alloy of Fe, Co, V; wherein the direction of the feed of said blades is parallel with the direction of a magnetic field across the poles of the flux-conducting soft iron members, and wherein a flux-guiding magnet made of an RCo alloy (where R represents a rare earth metal) is placed into the air gap between the tapering shanks of the flux-conducting soft iron fitted to the permanent magnet.

4,682,138

PUSH-BUTTON ACTUATED OVERLOAD PROTECTIVE CIRCUIT BREAKER

William F. Sell, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 889,477
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 8522254[U]
Int. Cl.[4] H01H 71/16
U.S. Cl. 337—68 9 Claims



1. A push button-actuated overload protective circuit breaker with bimetal cutout and having a central longitudinal circuit breaker axis; said circuit breaker comprising a housing, a push button extending into the housing from the outside, and, in the interior of the housing,

(a) a fixed contact element and a bimetal contact element, arranged besides each other and being devised each as an elongated punched-out part having the shape of substantially a right parellelepiped of flat rectangular cross-sectional area, both contact elements being mounted in a mounting wall of the housing, and having each a longitudinal central axis, substantially parallel with said longitudinal circuit breaker axis, and two opposite large faces and, connecting said large faces, two opposite narrow side faces therebetween, main sections through said longitudinal contact element axes parallel with said large faces being located in planes which are spaced from, but parallel with each other, and each of said contact elements having an inner free end, located inside said housing interior; a fixed contact post mounted on said inner free end of said fixed contact element,

(b) a bimetal snap disc being fastened with a first end thereof on the inner free end of said bimetal contact element and extending transverse to said longitudinal axes of said contact elements, another end of said bimetal snap disc, opposite said first end thereof, overlapping the inner free end of said fixed contact element; and a movable contact post on said other end of said bimetal snap disc;

(c) a slider body having a longitudinal recessed passageway therein adapted for having the said fixed contact element extend through said recessed passageway in a manner such that said slider body at least partly surrounds said fixed contact element and is displaceable on the same rearward and forward in the direction of said longitudinal circuit breaker axis,

said slider body comprising an insulating wall member having a wall surface extending between the main sections of the two contact elements and being supported for displacement in the direction of the longitudinal axes of the contact elements; which insulating wall member is in a position outside but adjacent the two contact posts when they abut against one another in the rest position; and

which insulating wall member can be moved into a separating position between the two contact posts when the latter are moved apart from each other due to bending of the bimetal snap disc relative to a fixed portion of the bimetal contact element; and which insulating wall member is adapted for being displaced from a contact posts-separating position to the rest position by means of said pressure button.

4,682,139

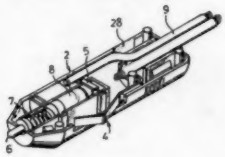
ELECTRICAL AUTOMOBILE PLUG

Jung-Tsan Kuo, No. 20, Her Chung Street, Tainan, Taiwan

Filed Aug. 15, 1986, Ser. No. 897,031

Int. Cl.[4] H01H *85/02, 85/52*

U.S. Cl. 337—186 **2 Claims**



1. An electrical plug comprising a base, a cover, first and second conducting strips, a contact and a spring, said base having a seat at the middle position therewithin to receive and keep the first conducting strip therein; said base further having a first hole to expose part of said first conducting strip to act as cathode of said plug; said base also having an elongated seat capable of holding a fuse disposed proximate to one end thereof with a second hole on said one end; said contact having a slender post disposed on said hole which acts as an anode; said contact further having a spring holding means to hold the spring thereon; said base also having a means for holding said second conducting strip, including two slots are disposed on one side of said elongated seat with the first slot proximate to the second hole and the second slot remotely positioned from the second hole such that when said second conducting strip is placed at the first slot, said spring electrically contacts the second conducting strip, while when said second conducting strip is placed at the second slot, a fuse providable in said elongated seat is also placed between the spring and the second conducting strip so as to provide protection.

4,682,140

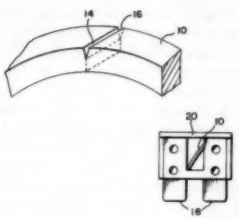
MINIATURE PLUG IN FUSE

Jose M. Diaz-Noriega, Apartado Postal 3020, 64000 Monterrey, N.L., Mexico

Filed Aug. 8, 1986, Ser. No. 894,940

Int. Cl.[4] H01H *85/14, 85/16*

U.S. Cl. 337—260 **3 Claims**



1. A fuse for opening an electrical circuit in response to a predetermined current flow comprising:

a plastic housing;

a pair of spaced conductive terminals supported in and extending outwardly from said housing for connection into an electrical circuit;

a fusible link within said housing electrically connected to said terminals and rigidly supported at its opposite ends thereby; and

means defining at least one cut extending partially through said link, at least a portion of the side walls of said cut being in electrical contact with each other at ambient temperature, but separable from each other in response to current generated heat causing bending of said link reducing the cross section of the link and raising its electrical resistance.

4,682,141

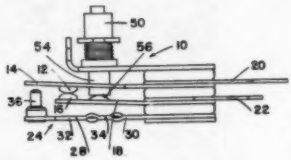
DYNAMICALLY OPTIMIZED THERMOSTAT (DOT) WITH TUNABLE BIMETAL ELEMENT

Colin D. Hickling, Frankfort, Ky., assignor to Trig, Inc., Frankfort, Ky.

Filed Feb. 18, 1986, Ser. No. 830,227

Int. Cl.[4] H01H *37/52*

U.S. Cl. 337—379 **18 Claims**



1. A tuned actuator element for a temperature responsive switch that provides control of initial overshoot and consistent operation of a heating element within a relatively narrow temperature range by opening and closing electrical contacts, comprising:

a bimetal assembly in the form of an elongated, relatively flat bimetal strip with bending action to open and close the contacts, said strip including a bimetal base portion and a bimetal extension portion connected together at a joint and integral tuning means for modifying the thermodynamic properties of the element; said tuning means including a plurality of spaced, relatively narrow connecting webs separated by at least one aperture in said bimetal strip for controlling the flow of heat through said strip and across the joint between the base and extension portions.

4,682,142

ROTARY POTENTIOMETER WITH SWITCH

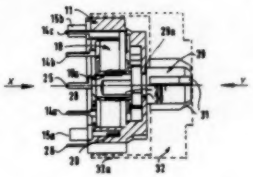
Martin Lohner, Balingen, and Fritz Prestel, Hausen a. Tann, both of Fed. Rep. of Germany, assignors to BSG-Schalttechnik GmbH & Co. KG, Balingen, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,810

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514708

Int. Cl.[4] H01C *10/36*

U.S. Cl. 338—172 **10 Claims**



1. Rotary potentiometer with switch, comprising a wiper that runs on a resistor track and at least one switch that can be actuated by the rotary motion of a fulcrum pin simultaneously, preferably when reaching the potentiometer end position, characterized in that an enclosed, prefabricated rotary potentiometer component (**10**) with its own casing and external connecting tongues (**14***a*, **14***b*, **14***c*) is inserted in an additional, cup-shaped upper casing that is open on one side and in which

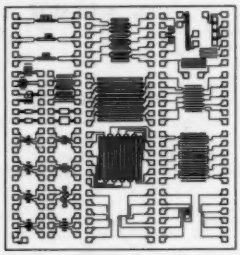
switching contact supports are located which are held in place by wall sections (16, 17, 18) of the additional casing (11), the said switching contact supports being switched by a cam actuating member (cam ring 27) attached to a fulcrum pin (29) that simultaneously effects the rotation and the mounting of the potentiometer component (10) in the upper casing.

4,682,143

THIN FILM CHROMIUM-SILICON-CARBON RESISTOR

John W. Chu, Los Altos Hills, and Bradley J. Bereznak, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1985, Ser. No. 792,723
Int. Cl.[4] H01C 1/012
U.S. Cl. 338—307 11 Claims



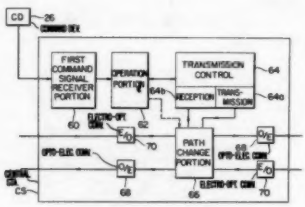
1. An improved thin film chromium-silicon-carbon resistor material comprising from about 25 to 35 wt. % chromium, about 40 to 55 wt. % silicon, and about 20 to 30 wt. % carbon and characterized by a resistivity of from greater than about 800 ohms per square to less than about 1200 ohms per square, a temperature coefficient of resistance of less than 200 ppm per degree Centigrade, and lifetime absolute and matching stability of less than 0.1% change in resistivity.

4,682,144

LIGHT TRANSMISSION SYSTEM FOR TRAINS

Hajime Ochiai, Nishinomiya, and Kenji Morihara, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 598,451, Apr. 9, 1984, abandoned. This application Oct. 18, 1985, Ser. No. 788,971
Claims priority, application Japan, Apr. 7, 1983, 58-62488
Int. Cl.[4] B61L 15/00; G08B 26/00
U.S. Cl. 340—48 5 Claims



1. A light transmission system for a train including at least two sub-train compositions each composed of a plurality of interconnected vehicles including end vehicles comprising

a command signal generating means disposed in each of said end vehicles, said means in a selected one of said end vehicles used as a head vehicle for generating a first command signal; and

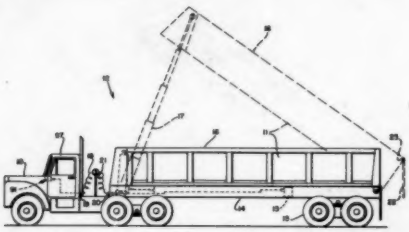
central stations including at least one last central station respectively disposed in each of said end vehicles, each of said central stations including means for receiving operating signals and being responsive to said first command signal for generating a second command signal and responsive to a received second command signal for passing therethrough any of said operating signals input thereto when said central station is a station other than said at least one last central station and for returning any of said operating signals input thereto when said central station is said at least one last central station.

4,682,145

TRUCK LEVEL SENSING AND INDICATING SYSTEM

Clarence A. Brawner, Jr., 7207 Fisher Rd., Dallas, Tex. 75214

Filed May 3, 1985, Ser. No. 730,204
Int. Cl.[4] B60Q 1/00
U.S. Cl. 340—52 H 8 Claims



1. A level sensing system for trailer dump trucks with a sensor-data transmitter positioned in a truck where it is to monitor the transverse level condition of the truck generally on the trailer frame in the area of the trailer rear wheels comprising: a sensor-data transmitter mountable on a truck; a data receiver and display unit usually positioned in the cab of a truck; a plumb vane included in said sensor-data transmitter; pitch axis mount means for said plumb vane; roll axis mount means for said plumb vane; a frame mounting said plumb vane and said roll axis mount means; dual cross members at the lower portion of said frame one in front of said plumb vane and one behind said plumb vane; said frame mounting a plurality of light emanating devices on one of said dual cross members of said frame; said frame also mounting a plurality of light sensitive activation devices subject to activation and deactivation by the amount of light impinging thereon; said pluarality of light emanating devices and said plurality of light sensitive activation devices positioned such that light paths between matched pairs of said devices are subject to intrusion interruption by said plumb vane when said sensor-data transmitter experiences predetermined amounts of roll from the transverse level state consistent with the transverse level condition of the trailer truck wheel set the said sensor-data transmitter is mounted near; signal transmission means interconnecting said sensor-data transmitter and said data receiver and display unit; and indicator means with said data receiver and display unit activated to indicate a roll state of the wheel set and the sensor-data transmitter when predetermined left or right roll angles are exceeded; wherein said plurality of light emanating devices are light emitting diodes; said plurality of light sensitive activation devices are phototransistors; said sensor-data transmitter is a digital data transmitter; said data receiver is a digital signal processing data receiver; said signal transmission means is a system with a common potential reference line, a DC voltage level line, and digital signal line means; there is a left hand set and a right hand set of light emitting diode and phototransistor combinations positioned to the right and left relative to said plumb vane and so sensitivity set as to trigger off with roll to a respective left or right side beyond a predetermined set degree of roll; and wherein said data receiver and display unit

includes at least two lights as indicator means indicating a roll state of the wheel set and the sensor-data transmitter by one of the lights coming on when predetermined left or right roll angles are exceeded.

4,682,146

AUTOMOTIVE INDICATOR SYSTEM

Harry Friedman, III, 9 Sewell Ave., Brookline, Mass. 02146

Filed Jan. 13, 1986, Ser. No. 818,261
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—77 **21 Claims**

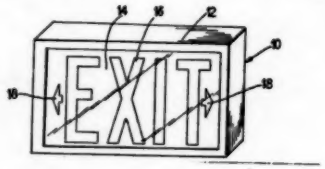
1. A rare gas automobile indicator light system comprising;
an elongated rare gas tube having a pair of electrodes, one disposed at each end of the tube,
means for mounting said rare gas tube at the rear of the automobile in a position viewable behind the automobile,
means for controlling power applied to both electrodes on a selective basis to provide illumination of the rare gas tube,
said means for controlling including first control means operative from first switch means for exciting only one electrode at a variable increasing power level to cause light intensity to progress from the end of the tube at which is disposed the excited electrode to the other end of the tube to thereby provide a light sweeping effect to indicate one of right and left turn indication,
and second control means operative from second switch means for simultaneously exciting both electrodes at a substantially constant power level to provide a substantially constant light output to indicate one of park and brake indication.

4,682,147

EMERGENCY SIGN

Norman E. Bowman, Jonesboro, Ark., assignor to Don Gilbert Industries, Inc., Jonesboro, Ark.

Continuation of Ser. No. 749,813, Jun. 28, 1985, abandoned.
This application Nov. 12, 1986, Ser. No. 929,514
Int. Cl.[4] G08B *7/00*
U.S. Cl. 340—286 R **9 Claims**



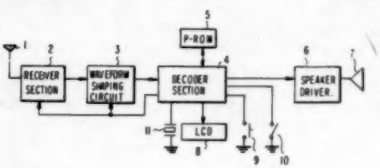
1. An emergency sign comprising:
a housing,
at least one display board mounted within said housing,
a plurality of light emitting diodes arranged on said display board to form a perceiveable intelligence, said light emitting diodes connected in a plurality of series circuits, each of said series circuits having an identical number of light emitting diodes, said series circuits connected in parallel,
a control circuit connected across said series circuits for supplying power to said light emitting diodes, said control circuit including:
a transformer connected to AC power,
a rectifier connected to outputs of said transformer,
a voltage regulator connected across said rectifier and having an output connected to said plurality of series circuits,
a battery,
a comparator having a first input at a first threshold level connected to an output of said rectifier to trigger said first threshold level in response to signals from said rectifier, a first output of said comparator for transmitting a first triggering signal upon the triggering of said first threshold level,
means responsive to said first triggering signal for connecting said battery to said plurality of series circuits,
a second input of said comparator connected to said battery and having at least a second threshold level, a second output of said comparator for transmitting a second triggering signal upon the triggering of said second threshold level, and
means responsive to said second triggering signal for applying charging current to said battery.

4,682,148

DISPLAY PAGER HAVING MEMORY OVERFLOW INDICATION AND CONCURRENT MESSAGE DISPLAY FUNCTIONS

Yoshio Ichikawa, and Kazumori Yamada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,311
Claims priority, application Japan, Nov. 27, 1982, 57-206862
Int. Cl.[4] H04Q *9/00*; H04M *11/02*; G06F *3/14*
U.S. Cl. 340—311.1 **12 Claims**



1. A radio paging receiver for receiving a carrier wave modulated with a paging signal comprising a preamble code, and address code and a message, said receiver comprising:
memory means for storing a prescribed number of received messages;
display means having a plurality of first display digits and one second display digit;
first counter means (AC) for counting the number of messages which are received during the display of an earlier received message on said first display digits;
second counter means (RC) for counting the number of messages which have been read out in response to switching signals produced by actuation of a manually operable switch (9), said second counter means registering a count of one on the first actuation of said switch when no message is displayed on said first display digits and thereafter being incremented on successive actuations of said switch; and
control section means for reading in response to any one of said switching signals a message out of said memory means and the contents of said second counter means and displaying the read-out message and the contents of said second counter means on said first and second display digits, respectively, counting up the contents of said second counter means every time a received message is read out and displayed, said control section means further including means responsive to said receiver receiving and storing a new message during the display of an earlier

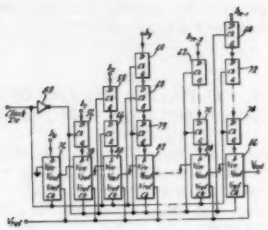
received message on said first display digits, for keeping the display of said earlier message as it is while altering the display of said second display digit to indicate that a new message has been received and stored and thereafter causing display of said new message in response to comoletion of the display of said earlier received message while causing the decrementing of the contents of said counter means each time a new message is displayed.

4,682,149

HIGH RESOLUTION PIPELINED DIGITAL-TO-ANALOG CONVERTER

Lawrence E. Larson, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 2, 1985, Ser. No. 782,777
Int. Cl.⁴ H03M *1/72*
U.S. Cl. 340—347 DA **15 Claims**



1. A device for converting a digital signal into an analog representation, the device having a one-bit digital-to-analog converter responsive to a clock signal having successive first and second portions, the one-bit converter comprising:

(a) a first capacitor;

(b) first switching means for charging the first capacitor upon receipt of the digital signal during the first portion of said clock signal;

(c) a second capacitor

(d) second switching means for charging said second capacitor during said first portion of said clock signal upon receipt of an analog from another of said devices;

(e) a third capacitor having substantially twice the capacitance of said first and second capacitors;

(f) third switching means for transferring the charge from the first and second capacitors to the third capacitor during the second portion of said clock signal; and

(g) isolating means for discharging and preventing the charging of the third capacitor during the succeeding first portions of said clock signal whereby the third capacitor responsively discharges an analog signal output during succeeding second portions of said clock signal.

4,682,150

DATA COMPRESSION METHOD AND APPARATUS

Gene R. Mathes, Zanesville, and Robert L. Protheroe, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1985, Ser. No. 806,309
Int. Cl.⁴ H03M *7/30*
U.S. Cl. 340—347 DD **5 Claims**

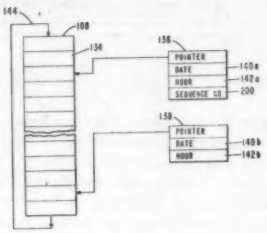
1. In a data processing system which includes a processor unit and a data terminal device having a keyboard operated to generate data indentifying the operator of the keyboard and the type of terminal transaction, means for outputting time of day data which includes the date, the hour and minutes, and memory means including a circular buffer for storing a plurality of data records which includes the identity of the operator, the type of terminal transaction and the time and date the keyboard is operated, a method for processing the data records comprising the steps of:

generating a first data record including a data portion identifying the keyboard operator, the type of terminal transaction and minutes and a time of day data portion comprising the hour and the date of the keyboard operation;

storing the first data record in a first location in the circular buffer;

storing the time of day portion of said first data record in a first storage area of the memory means;

generating a plurality of second data records each including a data portion identifying the keyboard operator, type of terminal transaction and minutes and a time of day data portion comprising the hour and date of the keyboard operation;



comparing the time of day data portion of each subsequently generated second data records with the time of day data portion stored in the first storage area of the memory means;

storing the data portions of each subsequently generated second data records identifying the keyboard operator, the type of terminal transaction and the minutes in consecutive locations in the circular buffer; and

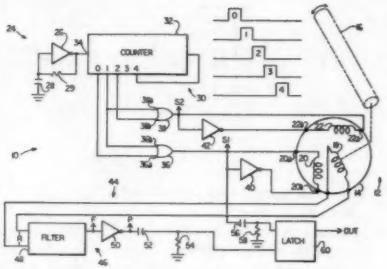
storing those time of day data portions of the second data records in said consecutive locations in the circular buffer when the time of day data portions are not the same as the time of day data portions stored in the first storage area of the memory means.

4,682,151

POSITION TO DUTY CYCLE CONVERSION APPARATUS AND METHOD

John P. Hoffman, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 4, 1985, Ser. No. 804,555
Int. Cl.⁴ H03M *1/00*
U.S. Cl. 340—347 SY **2 Claims**



1. Apparatus for producing an electrical signal having a duty cycle that varies in response to the angular position of a rotatable shaft, comprising:

a resolver having a frame, said shaft being rotatably mounted in said frame, a rotor coil connected to said shaft, and first and second stator coils each having respective first and second stator coil terminals, said stator coils being mounted on said frame and positioned about said rotor coil;

generator means for producing a rectangular-wave timing signal;

a counter having a plurality of coded output terminals, and a count input terminal connected to said generator means;

first and second logic gates, each having respective input terminals connected to predetermined ones of said counter coded output terminals, and output terminals connected to respective ones of said first and second stator coil terminals;

first and second signal inverters, each having an input terminal connected to a respective one of said first and second logic gate output terminals, and an output terminal connected to a respective one of said first and second stator coil terminals;

a low pass filter having an output terminal, and an input terminal connected to said rotor coil;

a signal conditioning circuit having an output terminal, and an input terminal connected to said filter output terminal;

a latch having a first input terminal connected to one of said first and second logic gate output terminals, and a second input terminal connected to said signal conditioning cicuit output terminal; and

wherein each of said first and second stator coils includes respective first and second stator coil terminals, one of said first and second stator coil terminals being connected to a respective one of said first and second logic gate output terminals, and the other of said first and second stator coil terminals being connected to a respective one of said first and second signal inverter output terminals.

4,682,152

DIGITAL DATA COMPANDING

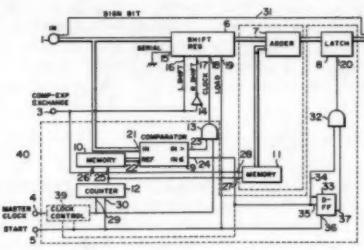
Hiroo Okamoto; Takao Arai, both of Yokohama, and Takashi Hoshino, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,868

Claims priority, application Japan, Apr. 20, 1981, 56-58532; Mar. 12, 1982, 57-37986

Int. Cl.[4] H03M *7/50*

U.S. Cl. 340—347 DD **21 Claims**



1. A reversible compressor-expander circuit for transforming a digital input signal into another digital signal having a reduced number of bits in the case of compressing and an increased number of bits in the case of expanding, comprising:

a digital input terminal for receiving a digital input signal of a first number of bits;

means for classifying the digital input signal in one of a number of predetermined ranges according to the magnitude of the digital input signal, including memory means for storing the boundary values of adjacent ranges;

means for transforming the digital input signal into an intermediate signal with a predetermined scaling assigned to the designated range by shifting the bit positions of said digital input signal to a lower order in the case of compressing and to a higher order in the case of expanding;

means for providing a predetermined off-set value assigned to the designated range; and

means for adding said intermediate signal and said off-set value to provide said another digital signal, the off-set value being so selected that said another digital signal increases continuously with the increase of said digital input signal, whereby each value of said output signal represents only one possible value of a received input signal.

4,682,153

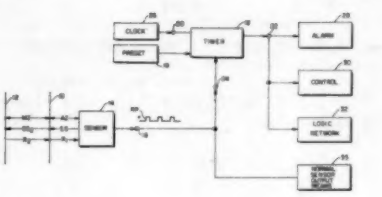
FAIL-SAFE SENSOR SYSTEM

James M. Boozer, Hampton; Robert W. Mayer; Alan J. Kumasaka, both of Hackettstown; Paul R. Strelecki, Metuchen, and Paul F. Lindlau, Long Valley, all of N.J., assignors to Amerace Corporation, Hackettstown, N.J.

Filed Oct. 23, 1985, Ser. No. 790,445

Int. Cl.[4] G08B *29/00, 1/00*; G08G *1/14*

U.S. Cl. 340—507 **16 Claims**



1. A fail-safe sensor system comprising: counting means having a selectively settable counting mode for counting input signals received at an input terminal representing an estimated maximum time period during which an object should be encountered within a sensor active zone or a monitor zone beyond and producing an output signal at an output terminal when the number of input signals received exceeds a predetermined number indicating that said sensor system may not be functioning; said counting means further having a reset mode for eliminating the count in said counting means and reinitiating the counting operation upon the receipt of a reset signal at a reset terminal indicating the presence of an object in the signal path active zone or monitor zone portions; transducer means for alternatively transmitting sensing signals traversing in order an active zone in which an object is sought and a monitor zone in which an object may be present and being adapted to receive return signals firstly from objects in said active zone and secondly from objects in said monitor zone; first means coupling said transducer means to said reset terminal of said counting means to apply a reset signal thereat for each return signal received by said transducer; clock means for producing a regular series of signals; second means coupling said clock means to said input terminal of said counting means to provide a series of input signals therefor; control means, and third means coupling said output terminal of said counting means to said control means to operate said control means if the count in said counting means is permitted to exceed said predetermined number between two consecutive reset signals.

4,682,154

LABEL FOR USE IN ANTI-THEFT SURVEILLANCE SYSTEM

Edward R. Fearon, Richardson, Tex., and Robert E. Fearon, Tulsa, Okla., assignors to E.A.S. Technologies, Inc., New York, N.Y.

Filed Feb. 12, 1986, Ser. No. 828,541
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **60 Claims**

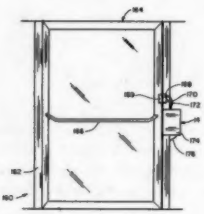
1. An electromagnetic element comprising:
a plurality of very thin layers of magnetic material having sufficiently small thicknesses so as not to individually exhibit magnetic properties;
a layer of dielectric material disposed between each of said thin layers to form said element; and
said layers interacting to provide said element with ferromagnetic properties at frequencies in preselected high ranges.

4,682,155

PERSONNEL SECURITY SYSTEM

John R. Shirley, Crestwood, Mo., assignor to Central Security Mfg. Corp., Fenton, Mo.

Filed Jan. 13, 1986, Ser. No. 818,260
Int. Cl.[4] G08B *13/08, 13/18*
U.S. Cl. 340—573 **18 Claims**



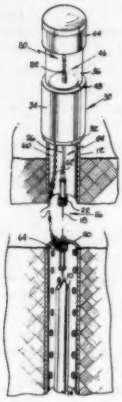
1. A security sensing system for monitoring the passage of persons through a door or like opening comprising:
a transmitter module for installing on persons to be monitored, a sensing module for installing adjacent to a door opening to be monitored, and means responsive to the opening of the door to enable the sensing module to respond to the signal transmitted by the transmitter module to produce an output response, and alarm means energizable in response to the production of the output response to produce an alarm condition,
the transmitter module including a housing having a transmitter circuit, a source of power for the transmitter circuit and transmitter antenna means installed therein,
the sensing module including a receiving circuit and associated sensing means located adjacent to the door opening to be monitored, and
said means responsive to the opening of the door including means to enable the receiving circuit in the sensing module whereby the receiving circuit can respond to signals transmitted by the transmitter module to produce a response for energizing the alarm means.

4,682,156

SOLVENT DETECTOR

H. Kent Wainwright, Laramie, Wyo., assignor to In-Situ, Inc., Laramie, Wyo.

Filed Nov. 2, 1984, Ser. No. 667,877
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—603 **27 Claims**



1. A solvent detecting apparatus adapted for use partially within a well casing, comprising:
a sensing element that is dissolvable in the presence of a solvent, said sensing element constituting a major portion of the length of that part of the apparatus within the well casing, wherein when a solvent contacts any portion of said sensing element at least part of the contacted portion of the sensing element dissolves;
a weighing assembly connected to a portion of said sensing element, said weighing assembly being movable between a first position and a second position;
a mass connected to a portion of said sensing element, said mass causing said weighing assembly to be located at said first position of said weighing assembly, said mass being separate from said sensing element and being made of a material different from that of said sensing element;
an alarm indicating means operatively connected to said weighing assembly for providing an indication of the presence of a solvent when any portion of said sensing element dissolves in response to contact with a solvent.

4,682,157

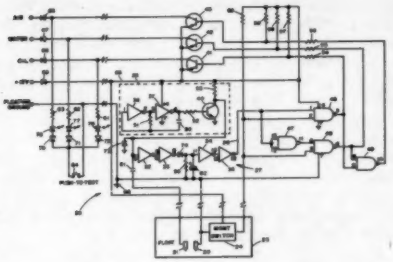
POLAR FLUID DETECTION SYSTEM UNAFFECTED BY POWER LINE VOLTAGES

Sara M. Mussmann, Indianapolis, and Roy E. Kidd, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 27, 1986, Ser. No. 833,188
Int. Cl.[4] G08B *21/00;* H03K *5/153;* H01H *47/12*
U.S. Cl. 340—605 **6 Claims**

1. An apparatus for sensing the presence of polar fluids regardless of the presence of undesired power line voltages comprising:
probe means for contacting said polar fluid;
means for providing an oscillating voltage to said probe means,
detector means for providing a fluid polar characteristic related signal, said detector means electrically connected to said probe means for sensing the state of said probe

means and including a means for preventing said undesired voltages in said polar fluid caused by said electric



power lines coming in contact with the fluid from altering said signal and adversely affecting said detector means.

4,682,158
GUIDANCE DEVICE FOR MANIPULATION OF MACHINE

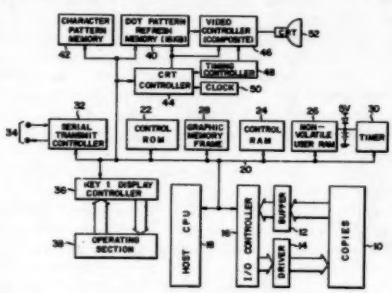
Masaji Ito, Ageo; Akira Midorikawa, Yokohama; Masayuki Shinada, Yokohama; Tatsuo Hirono, Yokohama; Hirobumi Yoshino, Tokyo, and Mitsuo Shibusawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1985, Ser. No. 724,162

Claims priority, application Japan, Apr. 18, 1984, 59-57173; Apr. 18, 1984, 59-57174; Apr. 18, 1984, 59-57175; Apr. 19, 1984, 59-78847; Apr. 27, 1984, 59-85881; Apr. 27, 1984, 59-85882; Apr. 27, 1984, 59-85883; Jun. 21, 1984, 59-126431; Jun. 22, 1984, 59-127536; Jul. 3, 1984, 59-136637

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—679 **4 Claims**



1. A device for guiding the manipulation of a machine, said machine having multiple keys to which various functions are assigned, comprising:

first sensor means for sensing a condition in which the machine needs a maintenance operation;

second sensor means for sensing a mounting condition of movable elements included in said machine;

display means for displaying prompts which specify a procedure of the maintenance operation;

storage means for storing displays of the prompts associated with the first sensor means; and

control means for controlling said storage means and display means in response to outputs of the first and second sensor means;

said control means being constructed to, when the first sensor means senses said condition of the machine, read displays of the prompts associated with said condition out of the storage means to display said prompts on the display means and, thereafter, sequentially read out displays of the prompts associated with the second sensor means to display said prompts on the display means in response to an output of the second sensor means and, upon completion of the steps indicated by said displayed data, provide prompts of additional steps in the process of operating said machine.

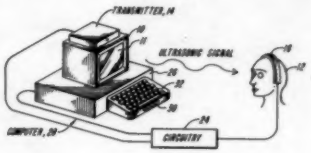
4,682,159
APPARATUS AND METHOD FOR CONTROLLING A CURSOR ON A COMPUTER DISPLAY

Keith K. Davison, Brookline, Mass., assignor to Personics Corporation, Concord, Mass.

Filed Jun. 20, 1984, Ser. No. 622,732

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—709 **25 Claims**



1. An apparatus for controlling the movement of a cursor of a computer display in response to corresponding movement of an operator's head, comprising:

transmitting means for generating and transmitting an ultrasonic signal of a suitable frequency or frequencies;

receiving means mountable relative to the operator's head so as to move with said head and so as to receive signals transmitted by said transmitting means, said receiving means including at least two individual ultrasonic receivers;

means for directly determining the phase of said received signals and producing information signals representing the phase relationship between signals received by respective said ultrasonic receivers;

processing means for receiving and storing said information signals from said phase determining means, said processing means also analyzing consecutive signals produced by said phase determining means, differences in said analyzed consecutive signals being used to compute position movement information for said cursor;

means for supplying said position movement information to a controller of the cursor of the computer display.

4,682,160
REAL TIME PERSPECTIVE DISPLAY EMPLOYING DIGITAL MAP GENERATOR

Paul B. Beckwith, Jr., Indialantic, and Donald S. Bistarkey, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 25, 1983, Ser. No. 517,037

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—729 **62 Claims**

1. For use with a digital data base in whicha terrain map in the form of data representative of the elevation of said terrain over a prescribed geographical area is stored, a method of producing, on a display screen, a perspective image of said terrain to an observer comprising the steps of

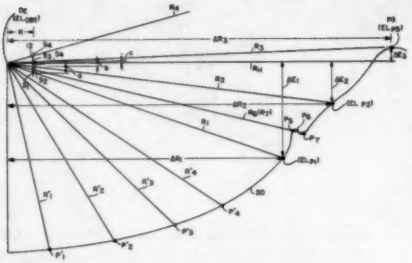
(a) storing, in addressable memroy locations of a memory, a portion of the digital data representing the elevation of said terrain over a portion of said geographical area such that, as stored in said memory, said terrain elevation representative data has a prescribed geographical orienatation;

(b) establishing an elevation and viewing direction of an observer and, within the data stored in said memory, the georaphical position of said observer as projected onto said terrain map;

(c) controllably accessing respective elevation data values

stored in addressable memory locations of said memory which effectively correspond to points lying along a plurality of contour paths respectively radiating from an address corresponding to said geographical position and traversing said map;

(d) translating the points lying along said plurality of contour paths onto locations of said display screen in accordance with the effective intersections of a plurality of observation lines with a prescribed image window, said image window corresponding to the display screen as seen by said observer and having an effective elevation and geographical position on said terrain map determined in



accordance with said elevation and viewing direction established for said observer, said observator lines extending from the effective elevation of said observer at the establishes geographical position thereof through said points lying along said plurality of contour paths on said terrain map; and

(e) generating respective images of aid terrain at locations on said display screen as translated in step (d) corresponding to points lying along said plurality of contour paths on said terrain map in accordance with data accessed from said addressable memory locations of said memory in step (c).

4,682,161

VARIABLE SIZE CHARACTER DISPLAY WITHOUT LOSS OF OBSCURED CHARACTER POSITIONS

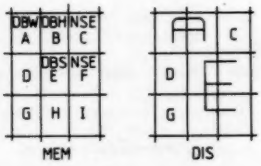
Richard E. F. Bugg, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,338

Claims priority, application United Kingdom, Sep. 1, 1983, 8323401

Int. Cl.⁴ G09G *1/06*

U.S. Cl. 340—731 **9 Claims**



1. A data display apparatus for displaying on a screen of a raster scan display device data represented by digital codes, the displayed data being comprised of discrete characters arranged in character rows each comprising a number of character positions, in which said digital codes represent both character data which identifies character shape and attribute data which identifies character size, said apparatus comprising, means for selectively displaying in accordance with the received data a character either normal size in one character position or enlarged size in at least two corresponding character positions in adjacent character rows, characterized in that said means includes a twin row buffer comprising two buffers each of which can hold the character and attribute data for all of the positions of a row of characters and of which one functions as a "fill" row buffer for receiving character and attribute data for a character row and the other as a "display" row buffer for providing such previously received data for the display of the preceding character row, and vice versa alternately, means operable in respect of each character position of the current "fill" row buffer for examining the corresponding character position in the current "display" row buffer and to insert into the "fill" row buffer position the attribute data for the "display" row buffer position, if the latter position is for the top half of an enlarged size character.

4,682,162

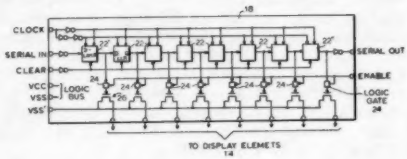
ELECTRONIC DISPLAY UNIT

Charles J. Holloman, Norwalk, Conn., assignor to Trans-Lux Corporation, Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 650,781

Int. Cl.⁴ G09G *3/22*

U.S. Cl. 340—799 **12 Claims**



1. A display unit comprising:

a plurality of display elements arranged in an array of rows and columns;

a plurality of memory elements adapted to store information indicative of the status of said display element, each memory element being associated with one of said display elements, memory elements corresponding to each row being arranged and connected to pass said information to an adjacent memory element along a preselected direction;

control means for feeding said information into said memory elements; and

a plurality of FETs, each FET having a gate connected directly to a corresponding memory element, each of said FETs having a channel resistance and source to drain voltage controlled by a voltage on said gate indicative of the status of a respective display element, from said memory element to provide a feed-back to said gate thereby providing a constant current source to the corresponding display element for a uniform brightness.

4,682,163

METHOD FOR WRITING CHARACTERS ON A LIQUID CRYSTAL DISPLAY

Forrest E. Brooks, Tempe, Ariz., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,189

Int. Cl.⁴ G09G *3/00*

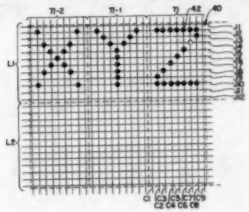
U.S. Cl. 340—805 **13 Claims**

1. A method for increasing the speed at which characters may be written onto a liquid crystal display of the type which includes a plurality of row and column electrodes, in which the writing of each element of a character is completed by the coincident application of M cycles of a write voltage to the row and column electrodes that are associated with that element, M being an integer greater than or equal to 2, and in which the elements making up each character are grouped into

a plurality of horizontal slices of that character, said method comprising the steps of:

(a) applying M/P cycles of the write voltage to the row and column electrodes that are associated with predetermined elements of successive horizontal slices of a selected character, and thereby partially completing the writing of said character, P being an integer which is smaller than M;

(b) simultaneously with step (a), successively applying M/P cycles of the write voltage to the row and column electrodes that are associated with predetermined elements of



the corresponding horizontal slices of at least one previously selected character, and thereby advancing the completion of the writing of said previously selected character;

(c) repeating steps (a) and (b) for successive sets of at least two horizontally adjacent characters; and

(d) discontinuing the coincident application of the write voltage to the row and column electrodes that are associated with predetermined elements of each character after M cycles of the write voltage have been applied to each of such elements.

4,682,164

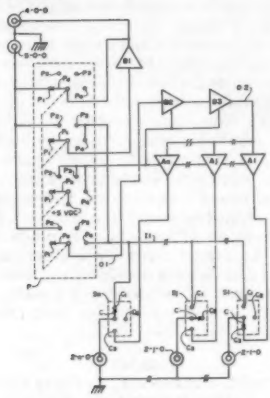
ATTACHMENT FOR REMOTE CONTROL OF A PLURALITY OF SIGNAL MONITORS

Donald D. Lacy, 11400 Wilson Rd., Utica, Ohio 43080

Continuation of Ser. No. 588,754, Mar. 13, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 935,072

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.03 **15 Claims**



1. A control system for selectively enabling monitoring at a master station or at any selected one of a plurality of slave stations of electrical signals generated by a respective computer at either the master station or by a respective computer at any one of the slave stations as selected by an operator of the master station, said control system comprising

(A) a master switching unit having

(1) a first input adapted to be connected to a master station computer signal source for reception thereat of signals generated by said master signal source,

(2) a first output adapted to be connected to a master station signal monitor for output thereto of signals to be monitored,

(3) a plurality of master inputs/outputs with each of said inputs/outputs adapted to be connected to a respective one of the slave stations for either input thereto or output therefrom of signals to be monitored, and

(4) master switching circuit means interconnecting with said first input, said first output and said inputs/outputs and selectively operable to alternatingly connect in signal transmitting relationship

(a) said first input and said first output,

(b) said first input and at least one of said master inputs-/outputs,

(c) one of said master inputs/outputs and said first output, or

(d) one of said master inputs/outputs said first output and at least one other of said master inputs/outputs, and

(B) a plurality of slave switching units each of which is adapted to be operatively associated with a respective one of a plurality of slave stations, each said slave switching unit having

(1) a slave input adapted to be connected to a computer signal source of the respective slave station for reception thereat of signals generated by said slave signal source,

(2) a slave output adapted to be connected to a signal monitor of the respective slave station for output thereto of signals to be monitored,

(3) a slave input/output coupled with a respective one of said master switching unit's inputs/outputs in signal transmitting relationship, and

(4) slave switching circuit means interconnecting with said slave input and said slave input/output and connecting said slave output and input/output in signal transmitting relationship and selectively operable to connect said slave input with said slave output in signal transmitting relationship or to interrupt such signal transmitting relationship.

4,682,165

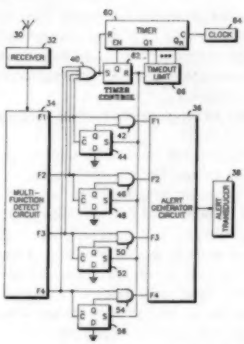
APPARATUS FOR INHIBITING REPETITIVE MESSAGE DETECTIONS IN A ZONE BATCHED COMMUNICATION SYSTEM

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1985, Ser. No. 794,993

Int. Cl.[4] H04Q *7/00;* **G08B** *5/22;* **H04B** *7/00*

U.S. Cl. 340—825.5 **16 Claims**



1. A multifunction receiver for generating a plurality of alerts, each alert associated with a function, the receiver being adapted for operation in a time sequential zone batched mes-

sage communication system having a plurality of zone comprising:

receiver means for receiving selective call signals transmitted in a first zone;

function detection means responsive to said receiver means for identifying a selective call signal designating the actuation of one of said multifunctions and producing a corresponding control signal in response thereto;

alert means coupled to said function detection means and responsive to said control signal for producing an alerting signal corresponding to the function detected; and

logic means coupled between said detection means and said alert means for storing the control signal and for disabling a second control signal generated in response to receiving the selective call signal from a second zone for a previously detected function, from being supplied to said alert means for a derived time interal.

4,682,166

SET POINT CHANGE-OVER CIRCUIT FOR FLUID CONTROL VALVES

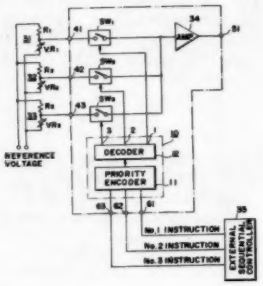
Kunihiko Takeuchi, Kawasaki; Fujio Baba; Yasuo Shimomura, both of Tokyo, and Yuji Morishige, Funabashi, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,410

Claims priority, application Japan, Nov. 8, 1984, 59-234050

Int. Cl.[4] H04Q *1/00;* **G05B** *15/02, 11/01;* **G06G** *7/57*

U.S. Cl. 340—825.5 **4 Claims**



1. In a set point change-over circuit for changing over the application of set point to a fluid control valve to one of a plurality of predetermined set points in accordance with a set point select instruction from an external control circuit, the combination comprising;

(a) a plurality of input means each having a preset predetermined set point;

(b) output means for generating one of said set points for application to said fluid control valve;

(c) switching means responsive to said set point select instruction to select said one set point to be applied to said fluid control valve from said set points preset in said input means and sending the same to said output means; and

(d) priority circuit means for sending said set point select instruction from said external control circuit to said switching means, said priority circuit means being responsive to the simultaneous application of two or more set point select instructions from said external control circuit such that only highest-priority one of said two or more set point select instructions is sent to said switching means and the other instructions are ignored.

4,682,167

DATA TRANSFER SYSTEM FOR NUMERICALLY CONTROLLED EQUIPMENT

Yoshiaki Ikeda, Hachioji, and Mitsuru Kuwasawa, Kunitachi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

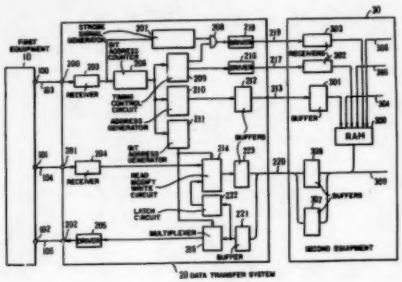
PCT No. PCT/JP85/00267, § 371 Date Jan. 16, 1986, § 102(e) Date Jan. 16, 1986, PCT Pub. No. WO85/05471, PCT Pub. Date Dec. 5, 1985

PCT Filed May 15, 1985, Ser. No. 822,422

Claims priority, application Japan, May 16, 1984, 59-98093

Int. Cl.[4] H04Q *9/00;* **G06F** *13/00;* **H04L** *13/00*

U.S. Cl. 340—825.23 **3 Claims**



1. A data transfer system through which each bit of serial data sent from first equipment is transferred to a predetermined bit of a predetermined address of a RAM in second equipment upon each occurrence of a plurality of clock pulses which are delivered from the first equipment in synchronism with each data bit, comprising:

a counter which is incremented by the clock pulses, said counter coupled to the first equipment;

an address generator, coupled to said counter, for responding to the output of said counter to generate an address of the RAM;

a bit address generator, coupled to said counter, for responding to the output of said counter to generate a bit address for specifying a bit position in one address of the RAM;

a timing control circuit, coupled to said counter, for responding to the output of said counter to generate timing signals for a read cycle and a write cycle succeeding the read cycle, during the period of generation of one address by said address generator; and

a read modify write circuit, coupled to said bit address generator and the first equipment, for substituting a bit of the serial data sent from the first equipment for data at the bit position specified by said bit address generator from a plurality of bits of a parallel data corresponding to the address generated by said address generator, the parallel data being read out of the RAM in the read cycle specified by said timing control circuit, the parallel data having the substituted data bit being transferred to the address in the RAM generated by said address generator during the write cycle specified by said timing control circuit.

4,682,168

TIME-SLOT ADDRESSED, SYSTEM KEYED MULTIPLEX DEVICE

Paul S. Chang, and Edward C. Dowling, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 567,476, Jan. 3, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,854

Int. Cl.[4] G08C *19/00;* **H04Q** *11/00;* **G05B** *23/02*

U.S. Cl. 340—825.65 **18 Claims**

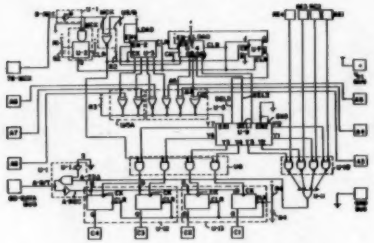
1. A remotely addressed terminal for a multiplex system of the type comprising a master controller which includes means for generating a series of clock pulses on a timing signal bus

and means for transmitting data between a data bus and the controller, said terminal comprising:

means, coupled to the timing signal bus, for maintaining a count of the clock pulses, said count comprising a first set of lower order bits and a second set of higher order bits;

interface means for transmitting a plurality of data signals between the data bus and the terminal, each of said data signals associated with a respective data channel;

means, included in the interface means and responsive to the first set of lower order bits, for selecting the data signal having the data channel corresponding to a current value of the first set lower order bits;



means for storing a preset address code;

means, included in the interface means and responsive to the second set of higher order bits and the preset address code, for causing the interface means to transmit the selected data signal between the data bus and the terminal when the preset address code corresponds to a current value of the second set of higher order bits;

means, responsive to the clock pulses, for generating a reset signal when the time interval between successive clock pulses exceeds a selected value; and

means for resetting the count in response to the reset signal.

4,682,169

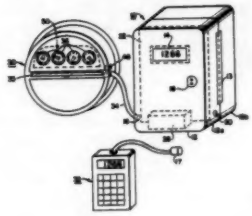
METHOD OF AND SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 776,719, Sep. 16, 1985, Pat. No. 4,639,728. This application Apr. 9, 1986, Ser. No. 849,897

Int. Cl.[4] G08C *19/16*

U.S. Cl. 379—104 **13 Claims**



1. A system for accumulating energy demand data from an electricity meter of a type having means for generating pulses corresponding to a demand rate, comprising:

a primary power supply;

an auxiliary battery power supply operative to provide power for said system during outages of said primary supply;

low battery circuit means for detecting when the output voltage of said auxiliary battery power supply falls below a predetermined threshold magnitude and for providing a low battery signal;

clock means for maintaining time data corresponding to the current time of day and date; and

memory means for storing time data from said clock means corresponding to the time of day and date at which said low battery circuit means provides said low battery signal.

4,682,170

APPARATUS FOR COLLECTING TOLL

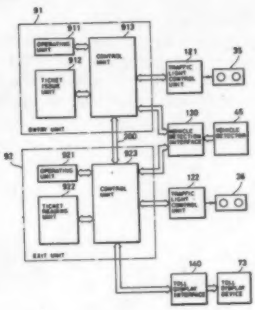
Mitsuru Kubota, Tokyo, and Kozo Amita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1984, Ser. No. 674,311

Claims priority, application Japan, Nov. 25, 1983, 58-220733

Int. Cl.[4] G07B *15/00*; **G08G** *1/065, 1/02*

U.S. Cl. 340—928 **1 Claim**



1. A apparatus for collecting toll from vehicles using a toll facility such as a toll road or a toll parking lot wherein tickets carrying data necessary for control are issued for the vehicles at one or a plurality of entry gates and the data on the tickets are read and identified at one or a plurality of exit gates, said apparatus comprising:

entry processing means installed at one end of an entry/exit common gate which is chosen from at least one of said entry gates and said exit gates and functions as both an entry gate and an exit gate for issuing said tickets;

exit processing means installed at another end of said entry/exit common gate for identifying said tickets;

first traffic signal means, disposed at said entry/exit common gate, for informing operators of vehicles entering said toll facility as to whether entry to said entry/exit common gate is permitted or not;

second traffic signal means, disposed at said entry/exit common gate, for informing operators of vehicles exiting said toll facility as to whether entry to said entry/exit common gate is permitted or not;

setting means for setting whether said entry/exit common gate is used as an entry gate or an exit gate; and

control means for causing said entry processing means to be in its operative state and said exit processing means to be in its inoperative state and for causing said first traffic signal means to indicate that entry into said toll facility through said entry/exit common gate is permitted and said second traffic signal means to indicate that exit from said toll facility through said entry/exit common gate is not permitted when said setting means is set so that said entry/exit common gate is used as an entry gate; and for causing said entry processing means to be in its inoperative state and said exit processing means to be in its operative state and for causing said first traffic signal means to indicate that entry into said toll facility through said entry/exit common gate is not permitted and said second traffic signal means to indicate that exit from said toll

facility through said entry/exit common gate is permitted when said setting means is set so that said entry/exit common gate is used as an exit gate, further comprising vehicle detecting means, electrically connected to said control means and disposed at said entry/exit common gate, for detecting a vehicle passing through said vehicle entry/exit common gate and class of the passed vehicle wherein said control means transfers information supplied from said vehicle detecting means to said entry processing means when said setting means is set so that said entry/exit common gate is used as an entry gate and said control means transfers said information to said exit processing means when said setting means is set so that said entry/exit common gate is used as an exit gate;

said entry processing means writes data indicative of data, time, class of vehicles, and gate number necessary for control and issues said ticket on which said data is written based on the transfer of said information produced by said vehicle detecting means; and

said exit processing means performs identification between the class of vehicle written on said ticket and information on the class of vehicle exiting said toll facility detected by said vehicle detecting means on the transfer of said information.

4,682,171

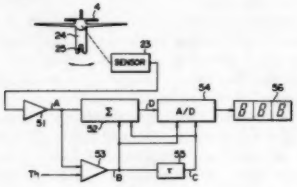
TURN-AND-BANK INDICATOR WHICH DISPLAYS THE TOTAL ANGLE OR TOTAL TIME OF A TURN

Shuji Nakamura, Komae, Japan, assignor to Tokyo Aircraft Instrument Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,159

Int. Cl.[4] G01C *23/00, 21/00*

U.S. Cl. 340—975 **6 Claims**



1. A turn-and-bank indicator which integrates the displacement of a pointer of the turn-and-bank indicator with respect to time, the pointer indicating the turning rate of an airplane, comprising:

a non-contact converter which outputs an electrical signal in proportion to the deflection of the pointer;

an amplifier which amplifies the output of the non-contact converter;

an integrator which obtains an integration of the output of the amplifier with respect to time; and

a digital display unit which displays the output from the integrator, the digital display unit being positioned adjacent the pointer,

wherein the integrator for obtaining the integration of the output of the amplifier with respect to time integrates the time corresponding to a period when the output of the amplifier exceeds a predetermined level which is attained during turning of the airplane, and wherein the digital display displays units of time.

4,682,172

ANTENNA SYSTEM FOR A FLYING BODY FOR JAMMING RADIO TRANSMITTING AND RECEIVING DEVICES

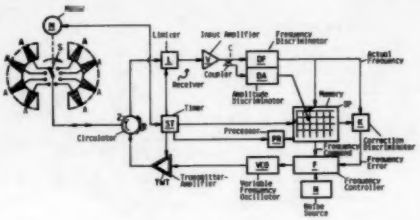
Günther Kuhrdt, Elchingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,563

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346155

Int. Cl.[4] G01S *7/38;* **H04K** *3/00*

U.S. Cl. 342—15 **9 Claims**



1. An antenna system for a flying body for jamming radio transmitting and receiving devices, comprising:

a plurality of individual signal transmit/receive antennas each having a directional radiation pattern which covers a different azimuth sector when the flying body is in its normal flight attitude;

a command receiver having an input for receiving signals from said antennas and including frequency discriminating means for producing representations of the frequencies of respective received signals, and further including amplitude discriminator means for producing representations of the amplitudes of the respective signals as received via one of the antennas;

a common transmitter including a variable frequency oscillator having a frequency control input and an RF output, a frequency control means having an output connected to said frequency control input and a frequency command input, said common transmitter producing a transmitter signal which is in essentially linear amplification of the RF signal produced by the frequency oscillator;

transmit/receive means connected to said common receiver and to said common transmitter for conducting signals received by said antennas to said common receiver and for conducting the transmitter signal from said common transmitter to said antennas;

switch means connected to said transmit/receive means for selectively or cyclically connecting said antennas to said common receiver and to said common transmitter via said transmit/receive means;

timer means connected to said common receiver, said common transmitter and said switch means, said timer means having alternating receive and transmit modes, said timer means enabling said common receiver during the receive mode to receive signals from any of the selected antennas during one complete cycle of said switch means and enabling said common transmitter during the transmit mode for furnishing transmitter signals to any of the selected antennas for at least one complete cycle of said switch means; and

memory and processor means being connected for storing the frequency representations from said frequency discriminating means and having an output connected for supplying stored frequency representations to said frequency command input of said frequency control means such that each stored frequency representation corresponds to one of said antennas via which signals were received, said memory means having storage locations for storing amplitude representations, said memory means

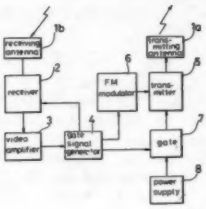
being organized as a two-dimensional matrix having rows corresponding to the respective antennas and columns corresponding to respective received signal frequency values, wherein the amplitude representations produced during a receive mode are each stored in a respective memory location defined by the column corresponding to the frequency of the received signal and the row corresponding to the antenna via which this signal is received, said memory means, during a given transmit mode, feeding frequency representations to said frequency command input of said frequency control means which correspond to the antenna currently connected to said common transmitter and which were stored as frequency representations during the previous receive mode, said processor means evaluates the amplitude representations stored in each column of said memory means and preserves only a selected number of amplitude representations representing the highest amplitude values stored in each column and deletes the rest, the selected number of amplitude representations being less than the total number in the respective column, the evaluating and deleting occurring between a receive mode and a subsequent transmit mode, and wherein said frequency control means is responsive to the frequency representation received at its frequency command input for tuning said variable frequency oscillator to the frequency indicated by that frequency representation.

4,682,173

RADAR RESPONDER

Keigo Kotoh, and Nobuhiro Nakamura, both of Kawanishi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,217
Claims priority, application Japan, Jan. 31, 1984, 59-16252
Int. Cl.[4] G01S *13/80*
U.S. Cl. 342—51 **5 Claims**



1. A radar responder for transmitting an electric wave signal in response to a radar signal from a searcher's radar, comprising:

FM modulator means for sweeping said electric wave signal across a predetermined frequency deviation width including the reception frequency of said searcher's radar a predetermined number of times within a predetermined period to produce a radar responding signal, in response to the reception of said radar signal;

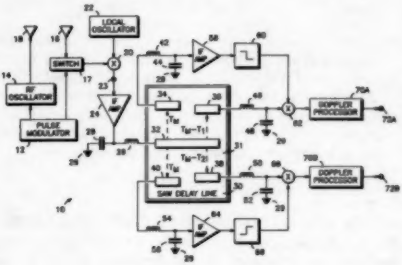
said modulator means including means for modulating said radar responding signal to produce a distinction signal for distinguishing an individual radar responder, and means for abbreviating said distinction signal when said searcher's radar is more than a predetermined distance from said radar responder and transmitting said distinction signal in full when said searcher's radar is less than said predetermined distance from said radar responder.

4,682,174

MOVING TARGET INDICATOR USING A SURFACE ACOUSTIC WAVE DEVICE

Carl T. Richmond, Scottsdale, and Joseph O. Lester, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 7, 1985, Ser. No. 785,125
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—160 **12 Claims**



1. A pseudo-coherent, moving target indicator comprising:

a first amplifier having an input and an output, said first amplifier input being adapted to receive an intermediate frequency signal;

a surface acoustic wave delay line operative at the intermediate frequency and having an input transducer, a first output transducer, and a second output transducer, said delay line input transducer being coupled to the output of said first amplifier, and said delay line first and second output transducers being located relative to the input transducer so that a distance betwen the input transducer and the first output transducer minus a distance between the input transducer and the second output transducer equals a predetermined distance;

a second amplifier having an input and an output, said second amplifier input being coupled to a first one of the first and second output transducers of said delay line; and

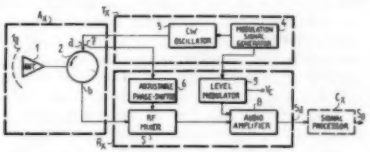
a mixer having a reference input coupled to the output of said second amplifier, having a signal input coupled to a second one of the first and second output transducers of said delay line and having an output for providing a Doppler signal.

4,682,175

FREQUENCY MODULATED CONTINUOUS WAVE RADAR AND APPLICATION THEREOF TO A ALTIMETRIC PROBE

Michel Lazarus, Gif-sur-Yvette, France, assignor to Thomson CSF, Paris, France

Filed Feb. 17, 1984, Ser. No. 581,415
Claims priority, application France, Feb. 18, 1983, 83 02721
Int. Cl.[4] G01S *13/32*
U.S. Cl. 342—165 **10 Claims**



1. Apparatus for reducing the composite coupling signal in a frequency modulated, continuous wave radar having a single antenna and a duplexer, comprising:

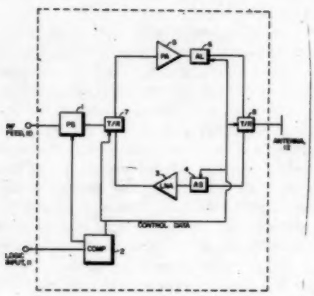
modulation means for providing a modulation signal;
oscillation means for receiving said modulation signal, and adapted for providing a modulated, continuous wave signal to an input of said duplexer;
phase shift means for receiving said modulated, continuous wave signal and providing a phase-shifted, modulated, continuous wave signal;
mixer means adapted for receiving a received signal from an output of said duplexer, and for mixing said received signal with said phase-shifted, modulated, continuous wave signal to provide a mixed signal;
injection means, having a first input coupled to said modulation means and a second input for receiving a DC control input signal, for providing an injection signal related to said modulated signal and to said control input signal; and
amplifier means for receiving said injection signal and said mixed signal and providing an output signal having reduced composite coupling signal components.

4,682,176

ACTIVE MATCHING TRANSMIT/RECEIVE MODULE

Edward J. Jones, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 12, 1986, Ser. No. 838,970
Int. Cl.[4] G01S 7/02
U.S. Cl. 342—175 **3 Claims**



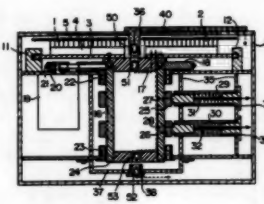
1. In combination with a phased array radar system having an antenna which transmits and receives radio frequency signals, a power ammplifier which provides said radio frequency signals to said antenna during transmission, and a low noise amplifier which receives said radio frequency signals from said antenna during reception, an active matching transmit/receive module comprising:
a control means which sends command signals during radar transmission to provide an optimum output impedance match for maximum power transfer, said control means also sending command signals to provide an optimum input impedance match between said low noise amplifier with said antenna;
an active load matching circuit which conducts said radio frequency signals from said power amplifier to said antenna, said active load matching circuit allowing a maximum power transfer during radar transmission by matching said power amplifier's output impedance so that it is approximately a complex conjugate of the antenn's load, said active load matching circuit including first and second output inductors, first and second grounding capacitors, each being connected with a common electrical ground, first and second output capacitors, and a first switching means which is electrically connected to said power amplifier and said antenna and conducts said radio frequency signals through a plurality of selectable output circuit configurations by making a first output selection between said first and second output inductors and connecting said first output selection to said power amplifier, said first switching means making a second output selection between said first and second grounding capacitors and connecting said second output selection to said first output selection, said first switching means making a third output selecton between said first and second output capacitors and connecting said third output selection in a series circuit between said first ouptput selection and said antenna, said first switching means being electrically connected to and receiving said command signals from said control means and making said first, second and third output selections in response thereto to produce variations of selectable output impedance for said power amplifier; and
an active source matching circuit which conducts said radio frequency signals from said antenna to said low noise amplifier while providing selectable impedance matching between said low noise amplifier and said antenna, said selectable impedance matching comprising a plurality of impedance matching values from which may be selected an optimum input impedance match between the low noise amplifier and the antenna which results in a minimum of noise during signal reception, said active source matching circuit including first and second input resistors; first and second input inductors; first and second input capacitors; and a second switching means which is electrically connected to said antenna and said low noise amplifier and conducts said radio frequency signals through a plurality of selectable circuit configurations by making a first selection between said first and second input resistors and connecting said first selection to said antenna and a grounding voltage, said second switching means making a second selection between said first and second input inductors and connecting said second selection to said antenna, said switching means making a third selection between said first and second input capacitors and connecting said third selection to said low noise amplifier and to said first and second selections, said switching means also being electrically connected to and receiving said command signals from said control means, and command signals directing said first, second and third selections, said second switching means thereby providing variations of selectable impedance matches, including said optimum input impedance match, between said low noise amplifier and said antenna.

4,682,177

DISPLAY FOR RADARS OR SONARS

Hajime Shimizu, 68, Yamate-cho, Naka-Ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Dec. 28, 1984, Ser. No. 687,421
Claims priority, application Japan, Jul. 7, 1983, 58-122386
Int. Cl.[4] G01S 7/26
U.S. Cl. 342—176 **8 Claims**



1. A display apparatus for visually presenting the reflected wave information of a sonar or radar, comprising:
a rotating member;
a plurality of light-emitting display elements supported on said rotating member;

a light-receiving means on said rotating member having a light-receiving opening directed axially along the rotating axis of said rotating member for receiving an optical signal regarding the reflected wave information and sending it to said plurality of light-emitting display elements;

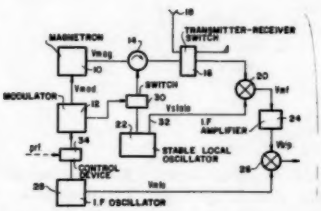
a fixed member adjacent said rotating member; and

light-emitting means on said fixed member having a light-emitting opening in spaced opposed relation to and coaxial with said light-receiving opening on the rotating axis of said rotating member for sending the optical signal to said light-receiving means.

4,682,178
HF ARRANGEMENT

Kjell S. Anflo, Hägersten, and Jan W. I. Grabs, Bälsta, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1985, Ser. No. 690,926
Claims priority, application Sweden, Jan. 12, 1984, 8400140
Int. Cl.[4] G01S *7/28*; H03B *9/10*; H03L *7/24*
U.S. Cl. 342—202 **5 Claims**



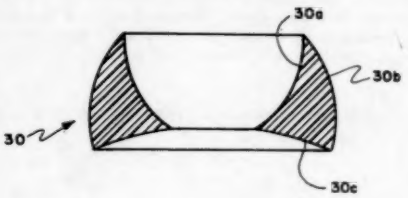
1. A coherent radar comprising a transmitting tube, in particular a magnetron, a modulator for driving the magnetron in order to generate and transmit HF-pulses, a stable local oscillator for producing an intermediate frequency signal by mixing its output signal with echo pulses caused by the transmitted pulses, which intermediate frequency signal has a frequency which corresponds to the difference between the stable local oscillator frequency and the frequency of the transmitted pulses, and an oscillator operating at an intermediate frequency the output signal of which is led to a phase sensitive detector together with the intermediate frequency signal obtained by the mixing in order to detect the echo pulse and to generate a signal containing information about the mutual phase position between transmitted and received HF-signals, characterized in that a signal derived from the stable local oscillator is fed to the tuning cavities of the magnetron, at least in the moment of transmission, and that the modulator and the intermediate frequency oscillator are mutually time controlled in such manner that the leading edge of the modulator pulse and thereby the magnetron pulse always appears at a predetermined phase position of the output signal of the intermediate frequency oscillator.

4,682,179
OMNIDIRECTIONAL ELECTROMAGNETIC LENS

Reinhold Gerharz, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,013
Int. Cl.[4] H01Q *15/02, 15/23*
U.S. Cl. 343—755 **1 Claim**

1. An omnidirectional electromagnetic lens with a body of revolution about an axis of revolution and formed from a material transparent and refractive to electromagnetic waves and having three curved surfaces: a top reflective surface and transparent side and bottom surfaces, whereby said top surface is a segment of a paraboloid with an axis colinear to said axis of

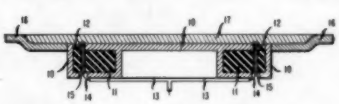


revolution, and said side and bottom surfaces are segments of spheres with their centers on said axis of revolution.

4,682,180
MULTIDIRECTIONAL FEED AND FLUSH-MOUNTED SURFACE WAVE ANTENNA

Michael J. Gans, Monmouth Beach, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 23, 1985, Ser. No. 779,108
Int. Cl.[4] H01Q *13/18, 15/10*
U.S. Cl. 343—769 **10 Claims**



1. A multidirectional antenna feed arrangement comprising:

a ground plane including an annular cavity within the ground plane comprising a width between inner walls which approximates a quarter-wavelength of a radio wave to be launched or received by the antenna feed arrangement to prevent a shorting of the radio wave within the cavity, and an annular slot forming an opening from the cavity in a first major surface of the ground plane, the annular slot including a predetermined width which produces a predetermined capacitive reactance that is substantially balanced by an inductive reactance produced by the approximate quarter-wavelength width of the cavity in the ground plane; and

means, disposed at multiple spaced-apart locations around a first edge of the annular slot, and capable of simultaneously delivering or receiving a radio frequency message signal to or from multiple locations around the annular slot for exciting or extracting a corresponding radio wave in the cavity and slot and launching or receiving said radio wave from the slot.

4,682,181
FLUSH MOUNTED TACAN BASE STATION ANTENNA APPARATUS

Theodore A. Dumas, Dallas, Tex., and Leslie V. Griffee, Marysville, Kans., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 22, 1985, Ser. No. 725,962
Int. Cl.[4] H01Q *1/38, 3/24*
U.S. Cl. 343—789 **2 Claims**

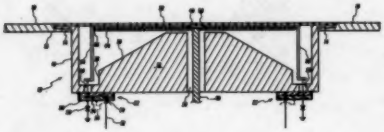
2. Antenna comprising, in combination:

a ground plane means having a circular cavity;

circular feed element means located in said cavity below the top of said ground plane means and having a diameter less than that of said cavity;

radiating conductive signal shaping means, comprising a plurality of triangular shaped elements having a substan-

tially circular profile, mounted even with the top of said ground plane means, the shaping means having a diameter similar to that of said feed element means and a diameter less than that of the cavity, juxtaposed said feed element means and in combination with said signal shaping means producing an omnidirectional signal; and



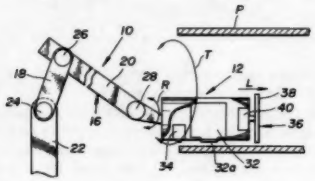
signal redirection means for selectively and electrically connecting at least one of said signal shaping means to said ground plane means to modify the output transmission signal to be directional.

4,682,182

MARKING DEVICE FOR PIPE

Akihiro Oyama, Yokosuka; Yutaka Funyu, and Kazuyuki Sakurada, both of Handa, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 805,341
Claims priority, application Japan, Dec. 4, 1984, 59-255101
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **28 Claims**



1. A method for applying marks to the surface of a hollow product with a constant radius of curvature, comprising the steps of:

mounting a marking head of the motile end of a multi-axis movable arm assembly;

mounting a sensor on said motile end of said movable arm assembly;

causing a first movement of said movable arm assembly carrying said marking head from a predetermined initial position toward said product;

detecting a reference position of said product during said first movement of said movable arm assembly by means of said sensor which reference position is set at a predetermined distance from a marking start position which is determined in relation to the distance between said marking head and said sensor;

deriving the position of said reference position of said product relative to said initial position;

deriving a marking start position on the basis of the derived reference position and a preset distance from said reference position of said product;

causing a second movement of said movable arm to carry said marking head to said marking start position;

deriving a path through which to move said marking head on the basis of said marking start position and preset offsets from said marking station position, said path including a marking end position;

causing a third movement to move said marking head along said path;

activating said marking head to perform a marking operation in synchronism with said third movement;

detecting when said marking head reaches said marking end position and then stopping said third movement; and

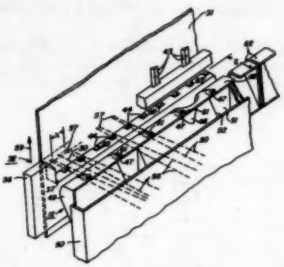
causing a fourth movement of said movable arm to return said marking head to said initial position.

4,682,183

GUTTER FOR AN INK JET PRINTER

Gilbert M. Elchinger, Kernersville, N.C.; Edward C. Mutschler, Jr., Yardley, Pa., and Eugene Behun, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 21, 1986, Ser. No. 887,453
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. An ink jet gutter assembly for a continuous multiple stream, pagewidth ink jet printer having an array of optical stitch sensors mounted in a frame member and spaced a predetermined distance upstream from a moving recording medium, the stitch sensors having light emitting input fibers with faces substantially in a plane perpendicular to the recording medium, each input fiber face having a center, ink droplets emitted from nozzles of a droplet generator of the printer are directed along trajectories to the recording medium to form images thereon one line of pixels at a time, the droplets not directed to the recording medium are diverted to the gutter assembly for collecting and reuse by the printer, the gutter assembly comprising:

at least one integral structure mounted upstream and adjacent the array of stitch sensors, the integral structure having a generally open concave shape with respect to the direction of droplet flight paths and having a flat surface portion with a plurality of equally spaced projections for collecting the gutter droplets, an arcuate portion, and a flat sloping portion;

the flat surface portion being below the trajectories of the droplets and substantially parallel to the stitch sensors and lineal printed segments by each nozzle;

the arcuate portion being intermediate the flat surface portion and the flat sloping portion with the flat sloping portion being furthest from the droplet trajectories; and

the plurality of droplet collecting projections formed in the flat surface portion in a manner which cause them to extend upwardly out of the flat surface portion toward and above the droplet flight paths, each projection having an entrance substantially perpendicular to the flight direction of the droplets for receiving the droplets from two adjacent nozzles that are not to be printed, the projection having relatively narrowly spaced side walls and a back wall that slopes from the entrance with a predetermined angle with respect to the trajectories of the droplets entering therein, the width of the back wall at the projection entrance being wider than its opposite end portion that contours into the flat surface portion of the integral structure at the interface between the flat surface portion and the arcuate portion, so that the side walls are closer to each other near said intersection and in a side view each

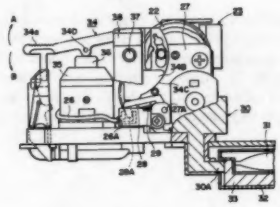
projection appears triangularly shaped, the back wall of the projection having a narower width at a location intermediate the entrance and the opposite end portion so that in plane view, it appears as an hour glass shape, this hour glass shape prevents interference with droplets from separate adjacent nozzles directed to the stitch point pixels on the recording medium.

4,682,184

SUCTION RECOVERING DEVICE FOR AN INK JET PRINTER AND INK JET PRINTER HAVING THE SAME DEVICE

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,396, Nov. 15, 1985, abandoned. This application Sep. 4, 1986, Ser. No. 903,843
Claims priority, application Japan, Nov. 19, 1984, 59-244054
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—140 R **12 Claims**



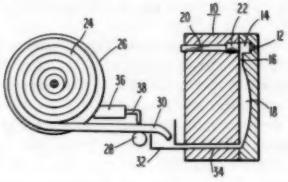
1. A suction recovering device for an ink jet printer provided with liquid injection recording means for injecting ink to the recording surface of a recording medium to thereby effect recording and a cap member opposed to said liquid injection recording means in a predetermined position, characterized in that a porous cellular structure in which capillary forces are created is provided below said cap member, said porous cellular structure being designed so as to be capable of contacting a porous absorbing member in a waste ink reservoir.

4,682,185

INK JET METHOD AND APPARATUS UTILIZING A WEB OF HOT MELT INK

John G. Martner, P.O. Box 292, Brookfield, Conn. 06804

Filed Nov. 8, 1984, Ser. No. 669,575
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.⁴ G01D *15/16, 9/00*
U.S. Cl. 346—140 R **23 Claims**



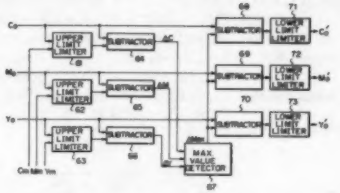
1. A method of operating an ink jet comprising the following steps:
advancing a flexible web of hot melt ink;
sequentially heating portions of the web as the web is advanced;
melting said sequentially heated portions of the web;
supplying the ink in the liquid state to the ink jet; and
ejecting droplets of ink from the ink jet.

4,682,186

METHOD FOR FORMING A COLOR IMAGE

Takashi Sasaki, Tokyo; Nobuaki Sakurada, Yokohama, and Hideaki Kawamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,763
Claims priority, application Japan, Nov. 4, 1983, 58-207770
Int. Cl.⁴ G01D *15/18;* **H04N** *1/46;* **G03F** *3/08*
U.S. Cl. 346—140 R **12 Claims**



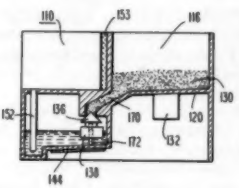
1. A method for forming a color image, comprising the steps of:
supplying a plurality of color signals which represent respective colors
providing a plurality of coloring materials respectively corresponding to each of said plurality of color signals, wherein the level of each said signal corresponds to an amount of coloring material used to represent the respective color;
detecting whether any said color signal exceeds a predetermined level corresponding to the maximum amount of coloring material capable of representing the respective color;
converting the color signals such that the levels of said converted signals are suppressed only when said detecting step detects a color signal which exceeds said predetermined level, wherein said level of said detected color signal is not suppressed below said predetermined level; and
variably controlling the respective amounts of said coloring materials to form a color image in response to said converted color signals.

4,682,187

INK JET METHOD AND APPARATUS UTILIZING GRANDULAR OR HOT MELT INK

John G. Martner, P.O. Box 292, Brookfield, Conn. 06804

Filed Nov. 8, 1984, Ser. No. 669,579
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—140 R **17 Claims**



1. A hot melt ink jet apparatus comprising:
an ink jet chamber including an inlet and an orifice for ejecting droplets of ink;

a bin including an outlet for storing hot melt ink in particle form;

means for advancing said particles in said bin toward said outlet including vibration means for fluidizing said particles; and

a melting area coupled to said outlet for melting said particles and supplying melted ink to said inlet of said chamber.

4,682,188

SERIAL INK JET PRINTING ARRANGEMENT PROVIDING A REMOVABLY MOUNTING OF THE PRINTING HEAD ON A CARRIAGE

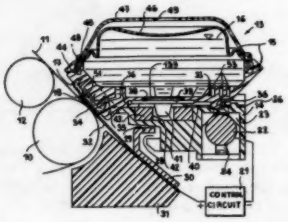
Pietro Castellano, Castellamonte, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 10, 1985, Ser. No. 774,369

Claims priority, application Italy, Sep. 10, 1984, 67890 A/84

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printing arrangement for printing lines of information on a print support carrier, comprising a single cylindrical guide member parallel to said lines, a carriage mounted on said guide member for being transversely moved with respect to said support carrier, a printing head mounted on said carriage, said printing head including a plate carrying at least one nozzle for the emmission of ink droplets and a linear projection parallel to said lines and adapted to contact said support carrier to hold said nozzle at a constant spacing from said support carrier, wherein the improvement includes:

an annular permanent magnet secured to said carriage, and

a ferromagnetic disk secured to said head and provided with a substantially frustoconical projection for centering said annular magnet, said annular magnet cooperating with said disk to hold said printing head removably in contact with said carriage and said linear projection in contact with said support carrier, whereby the angular position of said carriage on said guide member is automatically adjusted.

4,682,189

REPRODUCTION OF CHARACTER IMAGES, PARTICULARLY FOR TYPESETTING APPARATUS

Haydn V. Purdy, Down Cottage, Down Place, Windsor, Berkshire, and Ronald C. McIntosh, 17 Avenue Road, St. Albans, Hertfordshire, both of England

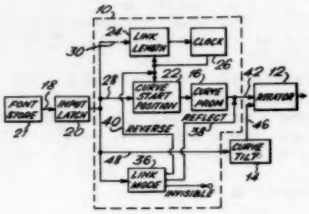
Continuation of Ser. No. 563,535, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 436,202, Oct. 22, 1982, abandoned, which is a continuation of Ser. No. 189,962, Jan. 21, 1980, abandoned. This application Sep. 2, 1986, Ser. No. 903,864

Claims priority, application United Kingdom, May 31, 1978, 25275/78; May 31, 1979, PCT/GB79/00093

Int. Cl.[4] G06F *15/626*; G09G *1/14*

U.S. Cl. 364—523 **20 Claims**

1. Apparatus for reproducing a character as a visible image, comprising a randomly addressable memory holding a sequential record of vector steps representative of incremental sections along the length of a predetermined curve, means to address the memory and generate a series of vector step instructions matched to the outline of the character to be reproduced, rotator means for orientating the individual steps and producing a modified sequence of step instructions according to the desired re-orientation, said rotator means further com-



prising means to generate from each of the individual vector step instructions two steps at right angles to each other, the size of these generated steps being determined by sine and cosine functions of the angle through which the section is to be rotated; and an incrementing plotter driven by said modified step instruction to trace a finely resolved sequential character outline.

4,682,190

IMAGE PROCESSING APPARATUS FOR COMBINING IMAGE AND CHARACTER DATA

Yoshinori Ikeda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 586,733, Mar. 6, 1984, abandoned. This application May 30, 1986, Ser. No. 869,824

Claims priority, application Japan, Mar. 8, 1983, 58-36673; Mar. 17, 1983, 58-44989; Mar. 17, 1983, 58-44990; Mar. 17, 1983, 58-44991

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—154 **35 Claims**

1. An image processing apparatus comprising:

image signal input means for entering an image signal;

character code signal input means for entering a character code signal;

means for half-tone processing the image signal to produce a digital half-tone image signal, said half-tone processing means including means for storing the image signal entered by said image signal input means;

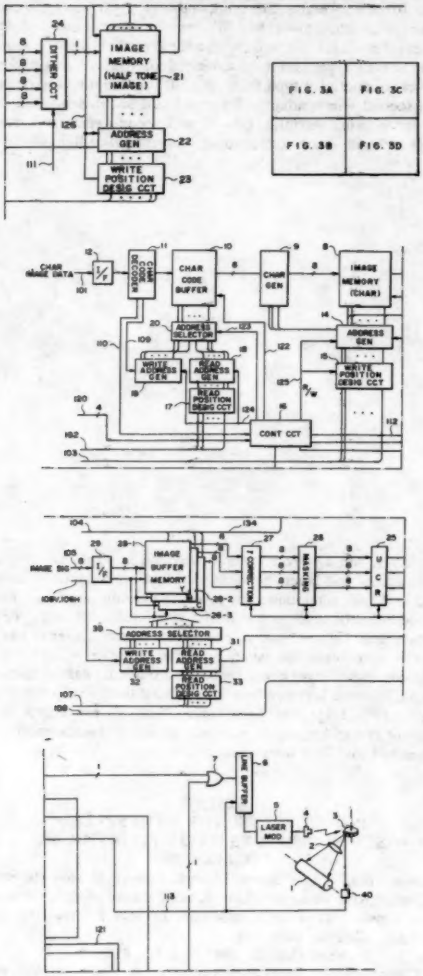
converting means for converting the character code signal into a digital character image signal, said converting means including means for storing the character code signal entered by said character code input means;

digital character image signal storing means for storing the digital character image signal converted by said converting means; and

common image forming means for receiving the digital half-tone image signal and the digital character image signal;

wherein said common image forming means provides a sync signal that is synchronized with an image forming opera-

tion, and the digital character image signal stored in said digital character image signal storing means is read out in



response to the sync signal and transmitted to said common image forming means.

4,682,191

HEAT-SENSITIVE RECORDING PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 5, 1986, Ser. No. 826,466

Claims priority, application Japan, Feb. 5, 1985, 60-20251

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—200 **14 Claims**

1. A heat-sensitive recording paper comprising a paper support having thereon a heat-sensitive color forming layer, wherein said paper support contains at least 10% by weight of a pigment and has an internal bonding strength as defined by Tappi-RC-308 of from 0.5 to 2.5 kg.cm.

4,682,192

HEAT-SENSITIVE RECORDING SHEET

Masaharu Nomura, Yono; Hiroaki Tsugawa, Matsudo; Yukio Ishizaka, Tokyo, and Hiroomi Hosoi, Urawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,366

Claims priority, application Japan, Jul. 31, 1984, 59-159235; Mar. 7, 1985, 60-43586

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—200 **9 Claims**

1. A heat-sensitve recording sheet comprising:

(a) a support sheet;

(b) a thermo-sensitive color forming layer formed on the said support sheet, said thermo-sensitive color forming layer comprising a colorless to pale color leuco dye and an acidic material capable of coloring the colorless to pale color lueco dye when heat is applied thereto;

(c) an over-coat layer formed on the said heat-sensitive, color-forming layer, said over-coat layer comprising a colloidal inorganic silicate selected from the group consisting of colloidal magnesium aluminum silicates and fluorine-containing colloidal magnesium silicates or a mixture of the said colloidal inorganic silicate and a water-soluble, high-molecular compound or a slightly water-soluble high-molecular compound.

4,682,193

RECORDING MATERIALS

Ken Iwakura, Kanagawa, and Takekatsu Sugiyama, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

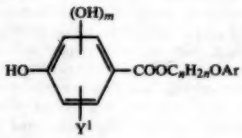
Filed Feb. 22, 1985, Ser. No. 704,695

Claims priority, application Japan, Feb. 22, 1984, 59-31952; Feb. 22, 1984, 59-31953; Mar. 6, 1984, 59-42368

Int. Cl.⁴ B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—209 **5 Claims**

1. A recording material containing (A) an electron-donating colorless dye and (B) an electron-accepting compound, wherein the electron-accepting compound is a compound represented by formula (IA) wherein said electron-accepting compound is represented by formula (IA):



(IA)

wherein Ar represents an aryl group, Y^1 represents an alkyl group, an alkoxyl group, a halogen atom or a hydroatom atom, m is 0 or 1 and n is an integer of from 2 to 5.

4,682,194

HEAT-SENSITIVE RECORDING MATERIAL

Toshimasa Usami; Toshiharu Tanaka, and Shohei Yoshida, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 735,227, May 17, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,093

Claims priority, application Japan, May 17, 1986, 59-99490

Int. Cl.⁴ B41M *5/18*

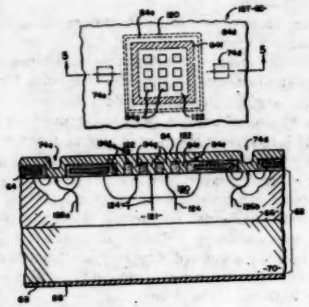
U.S. Cl. 503—215 **15 Claims**

1. A heat-sensitive recording material comprising a support and a recording layer comprising microcapsules containing a leuco dye and an organic solvent in a core thereof and a color developer outside of said microcapsules capable of reacting with said leuco dye to produce a color, said microcapsules having walls being of a polymer having a glass transition point of from about 60° C. to 200° C.

4,682,195
INSULATED GATE DEVICE WITH CONFIGURED EMITTER CONTACT PAD

Hamza Yilmaz, Dewitt, N.Y., assignor to General Electric Company, Research Triangle Park, N.C.

Filed Sep. 30, 1985, Ser. No. 781,383
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.4 1 Claim



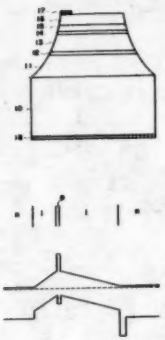
1. In a semiconductor device comprising a silicon semiconductor substrate having a major surface overlying a drift region of first conductivity type; a plurality of active cells for conducting a main device forward current, each of said cells including a base region of second conductivity type extending from said major surface into said drift region and an emitter region of said first conductivity type extending from said major surface into said base region forming an emitter-base PN junction therewith; a distributed gate electrode insulatingly spaced from said major surface and overlying a selected portion of each of said cells such that a voltage applied to said gate electrode creates an electric field that controls the magnitude of said main device current; an emitter electrode electrically insulated from said gate electrode and making ohmic contact with exposed portions of said base and emitter regions of each of said cells at said major surface, said emitter electrode including a metallic emitter pad spaced from said major surface by an insulating layer; a blocking region of second conductivity type extending from said major surface into said drift region and underlying said emitter pad; said emitter pad including a first portion disposed in ohmic contact with said blocking region; the improvement comprising: said first portion of the emitter pad being disposed so as to surround a second portion of the emitter pad, said second portion of the emitter pad including a plurality of contact portions extending through said insulating layer to make ohmic contact with said blocking region, said contact portions being substantially uniformly distributed over the area of said second portion.

4,682,196
MULTI-LAYERED SEMI-CONDUCTOR PHOTODETECTOR

Kazuo Sakai, Tokyo; Yuichi Matsushima, Tokorozawa; Shigeyuki Akiba, Tokyo, and Katsuyuki Utaka, Musashino, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Shinjuku, Japan

Continuation of Ser. No. 557,650, Dec. 2, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 806,746
Claims priority, application Japan, Dec. 7, 1982, 57-213301; Dec. 7, 1982, 57-213302
Int. Cl.[4] H01L 27/14, 29/205, 29/12
U.S. Cl. 357—30 3 Claims

1. A multilayered semiconductor photodetector formed by a sequential lamination of a first semiconductor layer having a carrier concentration more than 10^{17} cm^{-3}, a second semiconductor layer having a carrier concentration less than 10^{16} cm^{-3}, a third semiconductor layer having a carrier concentration more than 10^{17} cm^{-3} and a thickness less than 300 Å, a fourth semiconductor layer having a carrier concentration less than 10^{16} cm^{-3} and a fifth semiconductor layer having a carrier concentration more than 10^{17} cm^{-3}, said first semiconductor layer and said fifth semiconductor layer being of the same conductivity type, said third semiconductor layer being different in conductivity type from said fifth semiconductor layer, said second semiconductor layer and said fourth semiconductor layer being intrinsic, one of said second semiconductor layer and said fourth semiconductor layer being a light absorbing layer, and electrodes being provided to apply an electric field across said layers between said first semiconductor layer and said fifth semiconductor layer, the bandgaps of said first semiconductor layer and said fifth semiconductor layer being greater than those of said second semiconductor layer and said fourth semiconductor layer, and the bandgap of said third semiconductor layer being such that a potential barrier caused by a difference between bandgaps of said third semiconductor layer and said light absorbing layer effectively prevents a dark current caused by majority carriers in said first semiconductor layer and said fifth semiconductor layer.



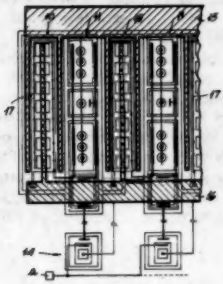
4,682,197
POWER TRANSISTOR WITH SPACED SUBTRANSISTORS HAVING INDIVIDUAL COLLECTORS

Flavio Villa, Milan; Bruno Murari, Monza; Franco Bertotti, Milan; Aldo Torazzina, Monza, and Fabrizio Stefani, Cardano al Campo, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Dec. 23, 1985, Ser. No. 812,109
Claims priority, application Italy, Jan. 8, 1985, 19050 A/85
Int. Cl.[4] H01L 29/72, 23/52, 27/10, 29/08
U.S. Cl. 357—36 8 Claims

1. An integrated semiconductor device, comprising a plurality of elementary transistors arranged side-by-side and an equal plurality of current source means, each elementary transistor including respective emitter, base and collector areas defining together an elementary transistor width, said collector areas of said elementary transistors extending adjacent to one another, being physically separated from each other and electrically connected to each other through a common collector contact area including collector contact portions extending side-by-side to each other in electrical contact with said collector areas, said emitter areas of said elementary transistors extending adjacent to one another, physically separated from each other and electrically connected to each other through a common emitter contact area including emitter contact portions extending side-by-side to each other in electrical contact with said emitter areas and in interleaved fashion with said collector contact portions, each said current source means having at least one terminal individually connected to said base area of a

respective one of said plurality of elementary transistors for current driving said respective one of said elementary transistor, each said elementary transistor being spaced apart from an adjacent elementary transistor by a space which is at least equal to one half said elementary transistor width.

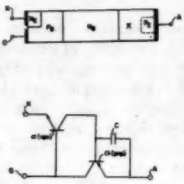


4,682,198

GATE TURN-OFF THYRISTOR WITH INTEGRAL CAPACITIVE ANODE

Shuroku Sakurada, Katsuta, and Yasuhiko Ikeda, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,139
Claims priority, application Japan, Mar. 7, 1984, 59-42124
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **4 Claims**



1. A gate turn-off thyristor comprising:

a semiconductor substrate having a first layer which is exposed on a first main surface of said semiconductor substrate and which is of a first conductivity type, a second layer of a second conductivity type, a third layer of the first conductivity type which is in contact with said second layer to form a PN junction with said second layer and which is exposed on a second main surface of said substrate, a fourth layer of the second conductivity type which is in contact with said third layer to form a PN junction with said third layer and which is exposed on the second main surface of said substrate, and a fifth layer of the first conductivity type which is provided between and in contact with said first layer and said second layer to form a PN junction with said second layer, said fifth layer having an impurity concentration which is selected to be smaller than those in said first and second layers, said fifth layer being exposed on the first main surface of said semiconductor substrate;

an anode electrode conductively connected to at least said first layer at the first main surface of said semiconductor substrate, said anode electrode also being connected to said fifth layer;

a cathode electrode conductively connected to said fourth layer at the second main surface of said semiconductor substrate; and

a gate electrode connected to said third layer at the second main surface of said semiconductor substrate,

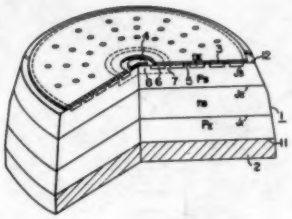
wherein said fifth layer functions as a capacitor to be charged during the turn-on operation and to be discharged during the turn-off operation of the gate turn-off thyristor.

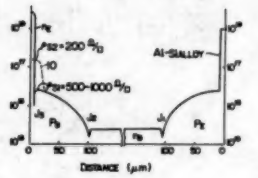
4,682,199

HIGH VOLTAGE THYRISTOR WITH OPTIMIZED DOPING, THICKNESS, AND SHEET RESISTIVITY FOR CATHODE BASE LAYER

Tsutomu Yatsuo; Naohiro Momma; Masayoshi Naito, and Masahiro Okamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 261,666, May 7, 1981, abandoned, which is a continuation of Ser. No. 949,119, Oct. 10, 1978, abandoned. This application Apr. 28, 1983, Ser. No. 489,505
Claims priority, application Japan, Oct. 14, 1977, 52-123235
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **15 Claims**





1. A thyristor comprising a semiconductor body having a pair of major surfaces disposed opposite to each other and four pnpn layers of alternate different conductivity types laminated between the major surfaces to form p-n junctions between adjacent layers, said four layers including first and second intermediate layers and first and second outer layers, a pair of main electrodes respectively making ohmic contact to each outer layer on each major surface, and means for applying a triggering gate signal to switch the blocking stage of the thyristor to the conduction state between the main electrodes, and further comprising

means for providing said thyristor with a dv/dt withstand capability substantially equal to or greater than 1500 V/μsec and a non-firing gate current substantially equal to or greater than 10 mA, said means comprising said first intermediate layer among said four layers having an impurity concentration higher than that of said second intermediate layer, with a maximum impurity concentration of 3 to 5×10^{15} atoms/cm^3 at an interface in the vicinity of said first outer layer adjacent to said first intermediate layer, wherein the impurity concentration in said first intermediate layer gradually decreases toward the second intermediate layer, and

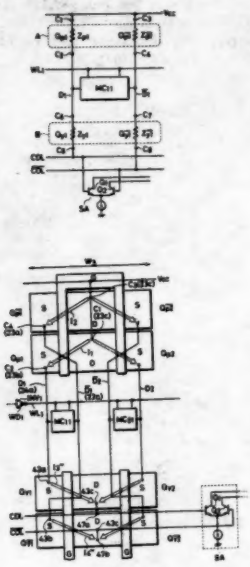
in conjunction with said maximum impurity concentration, said first intermediate layer having a thickness of 90 to 110 μm and a sheet resistance of 600 to 1000 ohsm/□ between said first outer layer and said second intermediate layer underneath said interface.

4,682,200

SEMICONDUCTOR MEMORY DEVICE WITH MATCHED EQUIVALENT SERIES RESISTANCES TO THE COMPLEMENTARY DATA LINES

Hideaki Uchida, Takasaki; Kinya Mitsumoto, Ohme; Yoshiaki Yazawa, Hitachi; Shinji Nakazato, Maebashi, and Masanori Odaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,485
Claims priority, application Japan, Apr. 12, 1985, 60-76351
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—41 12 Claims



1. A semiconductor memory device comprising:

(a) a plurality of memory cells which store information therein;

(b) a plurality of word lines and a plurality of pairs of complementary data lines coupled to said plurality of memory cells so that each memory cell is coupled to a word line and a pair of complementary data lines, ends on one side of said plurality of pairs of complementary data lines being connected to a power source voltage; and

(c) a sense circuit which is connected to the ends on the other side of said plurality of pairs of complementary data lines, and which reads information stored in each of the memory cells;

wherein said pairs of complementary data lines have equivalent series resistances that are equal to each other between the ends on one side connected to said power source voltage and the ends on the other side connected to said sense circuit.

4,682,201

GATE ARRAY CELL

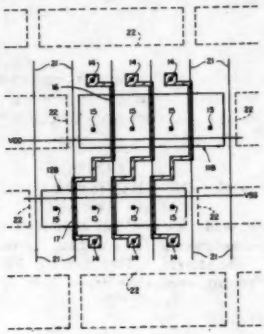
Robert Lipp, Los Gatos, Calif., assignor to California Devices, Inc., San Jose, Calif.

Continuation of Ser. No. 662,614, Oct. 19, 1984, abandoned.
This application Jul. 14, 1986, Ser. No. 883,474
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—42 5 Claims

1. A gate array device comprising a two-dimensional array of cells forming horizontal rows and vertical columns wherein vertically adjacent rows of cells are abutting, so that no routing channels adjacent the rows are reserved,

cells in alternate rows comprising a plurality of identical and abutting N-channel devices having horizontally aligned source /drain contacts,

cells of rows intermediate each of said rows of N-channel device cells comprising a plurality of identical and abutting P-channel deices, successive vertical cells of one conductivity type defining columns offset from columns defined by cells of the intermediate rows of opposite conductivity type, wherein all but one of the source/drain contacts in each said N-type cell are vertically aligned in columns with the source/drain contacts of one of said P-type cells to define a plurality of pairs of vertically



aligned complementary devices, and source/drain contacts of said plurality of pairs of complementary devices in vertically abutting cells lying on straight vertical lines parallel to the columns and a plurality of polysilicon lines comprising the gates of each said pair of vertically aligned complementary devices, all of said polysilicon lines following meandered patterns between horizontally adjacent source/drain contacts while connecting the gate contacts of said vertically abutting cells, connections between circuits formed on said gate array device comprising first and second layers of metal lines running parallel to the rows and columns of cells whereby said interconnects pass through the cells without an increase in size in cell area.

4,682,202

MASTER SLICE IC DEVICE

Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 30, 1984, Ser. No. 635,680
Claims priority, application Japan, Jul. 29, 1983, 58-137698
Int. Cl.[4] H01L 27/10, 29/70, 29/78
U.S. Cl. 357—45 9 Claims

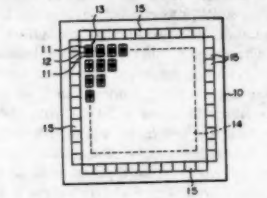
1. A master slice integrated circuit device comprising:

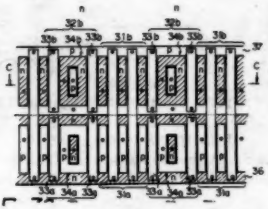
a basic cell array portion disposed at an inner area of a semiconductor chip; and

a plurality of input/output cells arranged at the periphery of said basic cell array portion and effecting signal transmission to and from external circuits;

said basic cell array portion having a plurality of first basic cells each comprising a p-type MIS transistor and an n-type MIS transistor, said first basic cells being divided into at least four blocks, and a plurality of second basic cells each comprising a pnp-type bipolar transistor and an

npn-type bipolar transistor, said second basic cells being arranged between said four blocks, wherein connections





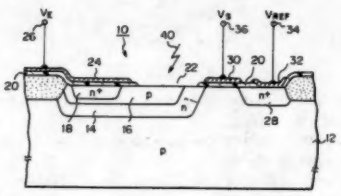
between said blocks of first basic cells may be made via said second basic cells.

4,682,203

SOLID-STATE IMAGE PICKUP DEVICE WITH PHOTOGRAPHIC SENSITIVITY CHARACTERISTICS

Ryuji Konda, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kawagawa, Japan

Filed Aug. 16, 1985, Ser. No. 766,335
Claims priority, application Japan, Aug. 23, 1984, 59-174158
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 **9 Claims**



1. A solid-state image pickup device having photosensitive cells disposed on a semiconductor substrate of a first conductivity type, wherein said photosensitive cells are arranged in a principal surface of said semiconductor substrate, each of said photosensitive cells includes:

phototransistor means for generating photocarriers associated with light incident thereto and storing the generated photocarriers therein;

said phototransistor means including,

a first region of semiconductor material of a second conductivity type which is opposite to the first conductivity type forming a collector electrode of said phototransistor means;

a second region of semiconductor material of the first conductivity type disposed in said first region forming a base electrode of said phototransistor means; and

a third region of semiconductor material of the second conductivity type disposed in said second region forming an emitter electrode of said phototransistor means;

readout gate means connected to one electrode of said phototransistor means for reading out in the form of a video signal the photocarriers stored in said phototransistor means; and

capacitor means disposed in said principal surface and connected to another electrode of said phototransistor means;

said capacitor means including,

a layer of insulating material disposed on said third region; and

a layer of conductive material disposed on said layer of insulating material forming one electrode of said capacitor means;

said third region also forming the other electrode of said capacitor means,

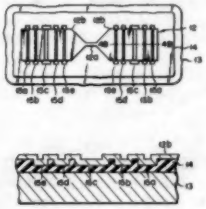
said readout gate means including an IGFET in which said first region functions as either of source and drain electrodes thereof.

4,682,204

FUSE ELEMENT FOR INTEGRATED CIRCUIT MEMORY DEVICE

Masakazu Shiozaki, Yokohama, and Hidetaro Nishimura, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 467,296, Feb. 17, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,128
Claims priority, application Japan, Mar. 9, 1982, 57-35800
Int. Cl.[4] H01L *27/02, 29/06, 23/48*
U.S. Cl. 357—51 **3 Claims**



1. A fuse element for use within an integrated memory which is formed on an insulation layer mounted on a semiconductor substrate having said integrated memory formed thereon and prepared from a prescribed material to be thermally broken off in case of need, comprising:

a melting away portion;

connecting portions which are integrally formed at both ends of said melting away portions with a greater width than that of said melting away portion for connecting said melting away portion to said integrated memory;

each of said connecting portions being provided with a plurality of paired step sections for increasing the heat capacity of said connecting portions, said plurality of paired stepped sections tightly contacting the surface of corresponding paired step sections formed on said insulating layer, each said paired step section of said connecting portion including a first step which steps down from a first level to a second level and a second step which steps up from said second level to a third level coplanar with the said first level.

4,682,205

SEMICONDUCTOR DEVICE

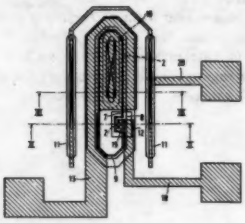
Adrianus W. Ludikhuize, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 541,643, Oct. 13, 1983. This application Mar. 5, 1986, Ser. No. 837,867

Claims priority, application Netherlands, Oct. 25, 1982, 8204105

Int. Cl.[4] H01L 29/40, 29/44, 29/78

U.S. Cl. 357—53 7 Claims



1. A semiconductor device comprising a semiconductor body having a planar pn-junction between a first region of a first conductivity type adjoining a surface and a second region of the second opposite conductivity type also adjoining the surface, which latter region has a lower doping than the first region, means for reverse biasing said planar junction in operation, an electrically insulating layer on the surface, and on this layer a narrow strip-shaped electrically conductive layer which is located above the pn junction, is bounded by a first and a second edge and extends above the second region, said first edge substantially coinciding with the line of intersection of the pn junction and the surface, the potential of said conductive layer being substantially equal to that of the first region, characterized in that the conductive layer is locally provided with a widened part for contacting purposes, said widened part being constituted by a protuberance of at least said first edge towards the first region thereby increasing said second region's depletion zone at said protuberance, said first region being altered relative to said first edge of said conducting layer at said widened part whereby said first edge substantially coincides with said line of intersection also at the area of said widened part and partly encloses an area of said second region.

4,682,206

THIN RIBBON OF SEMICONDUCTOR MATERIAL

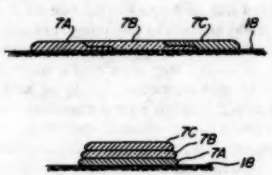
Noboru Tsuya, 1-38, Kashiwagi 2-Chome, Sendai City, and Kenichi Arai, Sendai, both of Japan, assignors to Noboru Tsuya, Sendai, Japan

Division of Ser. No. 597,565, Apr. 9, 1984, Pat. No. 4,525,223, which is a continuation of Ser. No. 375,314, May 5, 1982, abandoned, which is a continuation of Ser. No. 55,031, Jul. 6, 1979, abandoned. This application Apr. 10, 1985, Ser. No. 721,675

Claims priority, application Japan, Sep. 19, 1978, 53-114848; Oct. 12, 1978, 53-125485

Int. Cl.[4] H01L 29/04

U.S. Cl. 357—59 8 Claims



1. A thin ribbon of semiconductor material made of pure silicon or silicon with less than 10 atomic % of at least one additional impurity element, for improving the properties of a semiconductor, selected from the group consisting of hydrogen, phosphorus, sulfur, oxygen, boron, arsenic, tellurium, tin, selenium, aluminum, gallium, indium, chromium, silver, iron and bismuth; wherein said thin ribbon of semiconductor material has a polycrystalline structure composed more than 50% of grains having a grain size of more than 5 μm as a result of heat-treatment, has a thickness of 50–200 μm, and a sufficient flexibility such that it is windable on a pipe having a diameter of 34 mm without cracking or breaking, and is composed of at least two layers of two different types of semiconductor material selected from p-type, i-type and/or n-type semiconductor material.

4,682,207

SEMICONDUCTOR DEVICE INCLUDING LEADLESS PACKAGES AND A BASE PLATE FOR MOUNTING THE LEADLESS PACKAGES

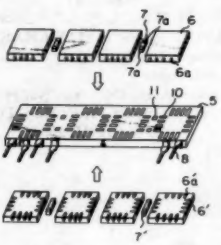
Hidehiko Akasaki, Aizuwakamatsu, and Takehisa Tsujimura, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 476,262, Mar. 17, 1983. This application Oct. 3, 1986, Ser. No. 915,851

Claims priority, application Japan, Mar. 17, 1982, 57-42254

Int. Cl.[4] H01L 23/32

U.S. Cl. 357—74 7 Claims



1. A semiconductor device for mounting on a printed circuit board, comprising:

a pluraity of leadless packages, each of said leadless packages comprises:

a semiconductor chip housed therein; and

a pluraity of electrodes formed on a surface of said leadless package;

a base plate having two main surfaces on which said leadless packages are mounted and having a side surface formed along one edge of said base plate, said base plate having conductor patterns formed on both of said two main surfaces, said conductor patterns having said electrodes soldered thereto, and said side surface aving pad patterns formed thereon, said base plate capable of being mounted on the printed circuit board in such a manner that said main surfaces are perpendicular to the surface of the printed circuit board; and

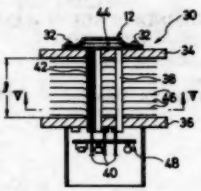
a plurality of lead pins which project from only one edge of said base plate in a direction parallel to said two main surfaces, each of said lead pins having a connecting portion perpendicularly folded, the length of said connecting portion being less than the thickness of said base plate, said connecting portion connected to respective ones of said pad patterns formed on said side surface along said one edge of said base plate so that said main surfaces are free from said lead pins.

4,682,208

TRANSISTOR PROTECTION DEVICE

Toshio Ohashi, Atsugi, and Shukou Yamamoto, Sano, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jan. 14, 1985, Ser. No. 691,066
Claims priority, application Japan, Jan. 13, 1984, 59-4517
Int. Cl.[4] H01L 23/02; F28F 7/00; H01B 7/34; H02B 1/00
U.S. Cl. 357—81 9 Claims



1. A transistor detection device for radiating heat generated in a transistor, comprising:

a base platform for supporting the transistor;

heat conducting rods attached to the bottom surface of the transistor and extending away from said bottom surface to conduct heat generated mainly at the bottom surface of said transistor away from said transistor;

electrically insulated hollow rods attached to the bottom surface of said transistor and receiving conductors extending from said transistor for connecting said transistor to an electrical circuit; and

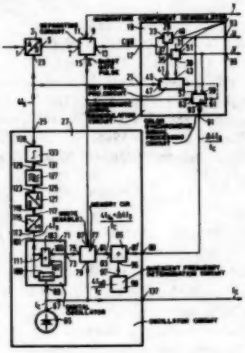
a plurality of radiation fins attached to said heat conductive rods to radiate the heat conducted by said rods from the transistor.

4,682,209

DIGITAL CHROMINANCE PROCESSOR WITH A PHASE AND FREQUENCY CONTROLLED DIGITAL OSCILLATOR INDEPENDENT OF THE STABLE OSCILLATOR FREQUENCY

Antonius H. H. J. Nillesen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1986, Ser. No. 836,236
Claims priority, application Netherlands, Mar. 25, 1985, 8500864
Int. Cl.[4] H04N 9/45
U.S. Cl. 358—19 2 Claims



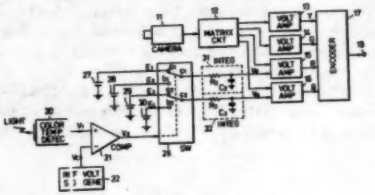
1. A digital chrominance signal processing circuit an input (1) of which is coupled at least via an analogue-to-digital converter (3) to an input (17) of a digital chrominance signal demodulation circuit (19) having a reference signal input (21) which, as is also a sampling signal input (23) of the analogue-to-digital converter, is coupled to an output (25) of an oscillator circuit (27) comprising a stable oscillator (65) and a digital-to-analogue converter (121) and a control signal input (89) of which is coupled to a control signal output (91) of the chrominance signal demodulation circuit, characterized in that the control signal input (89) of the oscillator circuit (27) is coupled via an adder circuit (85) to a frequency-determining input (73) of a digital oscillator (71) a clock signal input (69) of which is coupled to an output (67) of the stable oscillator (65) which is independent of the chrominance signal, whilst an output (101) of the digital oscillator (71) is coupled to the output (25) of the oscillator circuit (27) at least via the digital-to-analogue converter (121), whilst a further input (95) of the adder circuit (85) is coupled to a circuit (99) for producing a digital number which determines the quiescent frequency of the digital oscillator (71).

4,682,210

AUTOMATIC WHITE BALANCE ADJUSTING CIRCUIT FOR IMAGE PICKUP DEVICE

Yuichi Ikemura, Nagareyama, and Hiroshi Takano, Iwai, both of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Mar. 31, 1986, Ser. No. 846,572
Claims priority, application Japan, Apr. 5, 1985, 60-71934
Int. Cl.[4] H04N 9/73
U.S. Cl. 358—29 8 Claims



1. An automatic white balance adjusting circuit for an image pickup device, said image pickup device comprising a camera tube, a matrix circuit for obtaining a luminance signal and three primary color signals from an output image pickup signal of said camera tube, amplifier means for independently amplifying output signals of said matrix circuit, and an encoder for obtaining a color video signal from output signals of said amplifier means, said automatic white balance adjusting circuit comprising:

color temperature detecting circuit means for producing a detection signal having a voltage in correspondence with a color temperature of an incoming light to said image pickup device;

reference voltage signal generating circuit means for generating an A.C. reference voltage signal;

comparing circuit means for obtaining a discrimination signal by comparing said detection signal with said reference voltage signal;

a plurality of voltage source means for applying different voltages in correspondence with different color temperatures;

selecting circuit means for selecting and obtaining voltages from the voltage source means depending on the output discrimination signal of said comparing circuit means; and

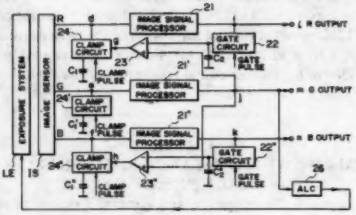
integrating circuit means for integrating output voltage signals of said selecting circuit means,

said integrating circuit means applying output voltage signals thereof to corresponding ones of said amplifier means to variably control amplifications thereof so that a white balance of the color video signal produced from said encoder is automatically adjusted.

4,682,211
COLOR IMAGE SENSING APPARATUS WITH ONE NON-FEEDBACK CLAMP CIRCUIT AND AT LEAST ONE FEEDBACK CLAMP CIRCUIT

Toshio Kaji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,239
Claims priority, application Japan, Jan. 27, 1984, 59-13155
Int. Cl.[4] H04N *9/04, 9/07, 9/09, 9/64*
U.S. Cl. 358—41 **16 Claims**

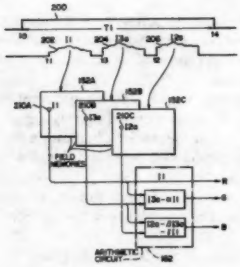


1. An image signal processing apparatus comprising:
(a) a plurality of channels for respectively processing different component signals of an image signal;
(b) a plurality of clamping means for respectively clamping the component signals in the respective channels;
(c) feedback means provided for at least one, but not all, of said channels, each said feedback means for feeding back the respective clamped component signal to an input of the respective clamping means; and
(d) level control means for controlling the level of said image signal on the basis of the component signal in a channel for which a feedback means is not provided.

4,682,212
SOLID-STATE IMAGE PICKUP DEVICE FOR PRODUCING COLOR-SEPARATED VIDEO SIGNALS BY USE OF AFTERIMAGE RISE-TIME

Masafumi Inuiya, and Masatoshi Tabei, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1985, Ser. No. 694,037
Claims priority, application Japan, Jan. 26, 1984, 59-10977
Int. Cl.[4] H04N *9/07, 9/04;* **G01J** *3/50;* **H01J** *5/16*
U.S. Cl. 358—44 **12 Claims**

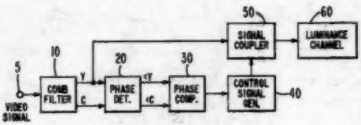


5. A solid-state image pickup device comprising:
a semiconductor substrate; and
an array of photosensitive cells formed on the substrate so as to produce, when driven, color-separated component video signals proportional to light incident to the array, each of said photosensitive cells comprising,
a plurality of first layers of a photoconductive material laminated over said substrate, each sensitive to all wavelengths of visible light, and
at least one second layer disposed between selected portions of adjacent ones of said first layers and comprising a non-photosensitive material which is substantially transparent with respect to the incident light.

4,682,213
MAGNITUDE INDEPENDENT HANGING DOT DETECTOR

Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1985, Ser. No. 791,145
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—31 **13 Claims**



1. In a video signal processor including: a comb filter for producing comb filtered luminance and chrominance signals, a luminance processing channel, and means for coupling said comb filtered luminance signal to said luminance processing channel including means for altering the frequency composition of said comb filtered luminance signal in response to a control signal; a magnitude independent hanging dot detector comprising:
phase detecting means coupled to said comb filter for generating a first signal representing the phase angle of said comb filtered luminance signal and a second signal representing the phase angle of said comb filtered chrominance signal;
means for determining the change over a predetermined time period of said first signal and the change over said predetermined time period of said second signal;
means for comparing the change over said predetermined time period of said first signal to the change over said predetermined time period of said second signal; and
means coupled to said comparing means for generating said control signal in response to said comparison.

4,682,214
TEST PATTERN PROJECTOR FOR A COLOR TELEVISION CAMERA

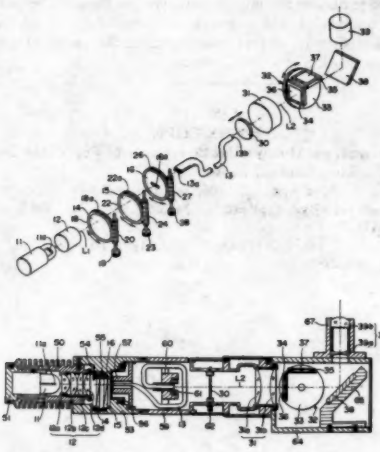
Kiyoshi Sato, and Nobuo Matsui, both of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Division of Ser. No. 480,138, Mar. 29, 1983, abandoned. This application Jun. 12, 1986, Ser. No. 873,877
Claims priority, application Japan, Mar. 29, 1982, 57-48828; Jan. 22, 1983, 58-9162
Int. Cl.[4] H04N *9/04*
U.S. Cl. 358—55 **3 Claims**

1. In a color television camera, a test pattern projector comprising:
a light source for emitting illuminating light;
a first optical system for converging the illumination emitted from said light source;
said light source having a filament that is elongated in a direction perpendicular to the optical axis of said first optical system;
a diaphragm having a slot therethrough, said slot extending in a direction perpendicular to said optical axis and said optical axis passing through the midpoint of the length of the slot;
means for rotating said diaphragm about said optical axis;

means for diffusing the illuminating light passing through said slot;

a parabolic shading compensating filter for making said diffused illumination light uniform in intensity, the light transmissivity of said filter progressively increasing in a direction away from the center thereof;



test pattern charts to be illuminated by said diffused illuminating light; and

a second optical system for forming an image of a selected said test pattern chart on an image pick-up apparatus.

4,682,215

CODING SYSTEM FOR IMAGE PROCESSING APPARATUS

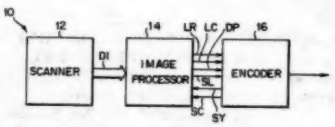
Eiichi Adachi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,351

Claims priority, application Japan, May 28, 1984, 59-108029; Feb. 14, 1985, 60-25146; Feb. 14, 1985, 60-25147

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—75 **3 Claims**



1. A coding system for reading image information in multiple density levels, dividing the read image information into a plurality of level planes each covering image information of the same density level, sequentially coding predetermined blocks of image information wherein each of said blocks is associated with one of said density levels, said coding system comprising:

adding means for adding identification data representative of respective ones of said level planes wherein said identification data is added before coded data associated with said ones of said planes; and

means for locating coded data associated with a predetermined one of said level planes based on said added identification data at the beginning of said coded data and means for omitting coded data which does not include valid data from any coded data associated with those of said level planes containing valid data.

4,682,216

COLOR IMAGE PICTURE FORMING PROCESS AND APPARATUS WHICH IMPROVES THE QUALITY OF THE BLACK PORTIONS OF THE PICTURE

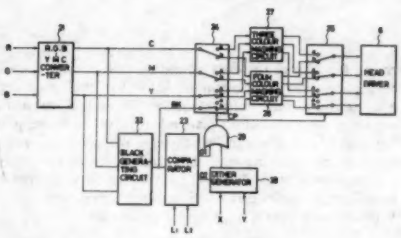
Takashi Sasaki, Tokyo; Nobuaki Sakurada, Yokohama; Hideaki Kawamura, Tokyo, and Jiro Moriyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,234

Claims priority, application Japan, Mar. 8, 1983, 58-37696; Mar. 8, 1983, 58-37697; Mar. 8, 1983, 58-37699; Jan. 18, 1984, 59-6930

Int. Cl.[4] G03F *3/08*; H04N *1/40, 1/46*; G01D *15/16*

U.S. Cl. 358—79 **50 Claims**



6. A color image picture forming process comprising the steps of:

forming dots of colorants of four colors of cyan, magenta, yellow and black;

a first expression step of expressing black in the picture using the cyan, magenta and yellow colorants;

a second expression step of expressing black in the picture using the black colorant;

selecting said first expression step when a black component of color image picture data is smaller than a predetermined value; and

selecting said first and second expression steps alternately or at random when the black component is larger than the predetermined value.

38. A color image picture forming process comprising the steps of:

forming dots of colorants of three primary colors and black;

detecting a black component from color image picture data;

combining the black component with a noise signal when the black component is larger than a first predetermined value, wherein the first predetermined value is 50% or more of the highest optical density expressible using the black colorant;

expressing black in the picture using the three primary color colorants when the black component is smaller than a second predetermined value lower than the first predetermined value; and

expressing black in the picture using the black colorant when the black component is larger than the second predetermined value.

4,682,217

VIDEO SIGNAL PROCESSING

Morgan W. A. David, Farnham, and David J. Hedley, Winchester, both of United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed May 6, 1986, Ser. No. 860,209

Claims priority, application United Kingdom, May 8, 1985, 8511648; May 8, 1985, 8511649

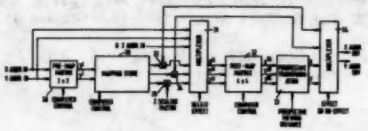
Int. Cl.[4] H04N *13/00, 7/18*

U.S. Cl. 358—89 **10 Claims**

1. A method of processing video signals to achieve a visual effect corresponding to that which would be achieved if an input two-dimensional image were projected onto a three-dimensional surface, the method comprising:

forming a video signal correspondng to said input two-dimensional image into a digitized sample values each having an input pixel adderess comprising X and Y coordinate values;

storing X and Y scaling multipliers and Z coordinate values corresponding to the respective pixel addresses on said three-dimensional surface to which each of said input pixel addresses will be moved in achieving said effect;



deriving from store the corresponding said X and Y scaling multipliers and Z coordinate value for each said input pixel address and multiplying said X and Y coordinate values of each said input pixel address by the corresponding said X and Y scaling multipliers respectively; and

supplying the resulting scaled X and Y coordinate values and the associated Z coordinate value to a perspective transformation device to derive the required output X and Y coordinate values corresponding to said effect.

4,682,218

SURVEYING INSTRUMENT WITH IMAGE DISPLAY UNIT

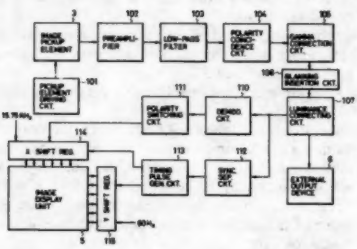
Atsumi Kaneko, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,099

Claims priority, application Japan, Oct. 31, 1984, 59-231030

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **1 Claim**



1. A surveying instrument comprising:

a rotatably mounted optical system including an objective lens and a focusing lens;

a solid-state image pickup element positioned to receive a light output from said optical system;

a video signal processing circuit for processing video signals provided by said solid-state image pickup element, said video signal processing circuit comprising: a preamplifier receiving an output of said solid-state image pickup element, a low-pass filter receiving as an input an output of said preamplifier, a polarity coincidence circuit receiving as an input an output of said low-pass filter, a gamma correction circuit receiving as an input an output of said polarity coincidence circuit, a blanking insertion circuit receiving as an input an output of said gamma correction circuit, a luminance correcting circuit receiving as an input an output of said blanking insertion circuit, a video demodulator circuit receiving as an input an output of said luminance correcting circuit, a polarity switching circuit receiving as an input an output of said demodulator circuit, X and Y shift registers driving said image display section, said X shift register receiving as an input an output of said polarity switching circuit, a synchronizing signal separating circuit receiving as an input an output of said luminance correcting circuit, and a timing pulse generator circuit receiving as an input an output of said synchronizing signal separator circuit, outputs of said timing pulse generator circuit being applied to drive said X shift register and said Y shift register; and

an image display section for displaying an image in response to outputs of said video signal processing circuit, said image display section being stationarily mounted on a body portion of said instrument.

4,682,219

ENDOSCOPE

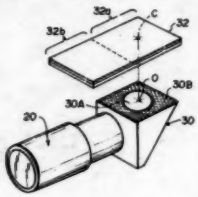
Satoshi Arakawa, Oomiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Aug. 12, 1986, Ser. No. 895,849

Claims priority, application Japan, Aug. 16, 1985, 60-125576[U]

Int. Cl.[4] H04N *7/18*; A61B *1/04*

U.S. Cl. 358—98 **6 Claims**



1. An endoscope for displaying an object of interest on a screen of a television set in response to a video signal obtained from a plate-shaped image sensor provided in the forward end portion of an insertable flexible section of said endoscope, said endoscope comprising:

said plate-shaped image sensor provided in a plane including the longitudinal center axis of said insertable flexible section of said endoscope; and,

an objective lens assembly including a light entering surface and a light emitting surface to be cemented to said image sensor, said light emitting surface being shielded in the periphery thereof by a light shielding material except for an image pick-up light path.

4,682,220

APPARATUS FOR DETECTING CONTAINERS HAVING A DEVIATING PROPERTY

Godefridus P. F. Beurskens, Bathmen, Netherlands, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,039

Claims priority, application Netherlands, May 3, 1984, 8401416

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—106 **4 Claims**

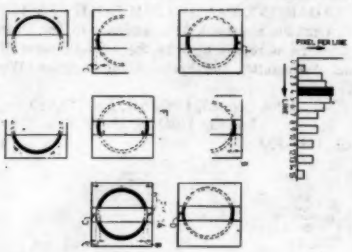
1. The method of inspecting entities such as bottles each having a part thereof, such as the rim of a bottle, which is of symmetrical shape, which comprises the steps of:

moving entities along a predetermined path;

electronically imaging the part of each entity having a symmetrical shape to produce an electronic image thereof;

electronically comparing portions of each electronic image which should be mirror images of each other by scanning the entity with a raster of lines each having discrete imaging points thereon to determine the extent, if any, in deviation from mirror image symmetry therebetween, the step of electronically comparing being effected with respect to two portions of the image which are the top and bottom of a strip of the electronic image of each part extending

centrally of the image and oriented perpendicular to the lines and also with respect to the two portions of the image which are respectively to the left and to the right of the strip; and



accepting or rejecting the entity based upon the extent of deviation from mirror image symmetry determined during the step of electronically comparing the portions of the image which should be mirror images of each other.

4,682,221

NON-CONTACT ELECTRO-OPTICAL DISPLACEMENT FOLLOWER

Iwao Yamazaki; Yuji Nakamichi; Keizo Abe, and Tatsuya Okudera, all of Tokyo, Japan, assignors to Ya-man Ltd., Tokyo, Japan

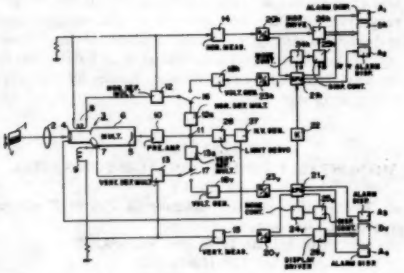
PCT No. PCT/JP84/00104, § 371 Date Oct. 31, 1984, § 102(e) Date Oct. 31, 1984, PCT Pub. No. WO84/03762, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 14, 1984, Ser. No. 668,878

Claims priority, application Japan, Mar. 15, 1983, 58-41555; Mar. 31, 1983, 58-53735

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—107 **8 Claims**



1. A non-contact electro-optical displacement follower which captures an image of a device under test optically by converting a pertinent optical image into an electron image through an optical-electrical converter and measures its displacement with a displacement follower which is characterized by possesssing an image dissector tube equipped with a horizontal deflection coil and/or a vertical deflection coil, and a variable voltage generator for horizontal deflection and/or a variable voltage generator for vertical deflection to selectively provide necessary deflection current to make the electron image optionally move to an appropriate place for adjustment or displacement measurement; said variable voltage generator for horizontal deflection and/or said variable voltage generator for vertical deflection being variable voltage generators for enlarging the measured field of view and each possessing an operation processing unit which decides the state of a target by receiving a signal displaying the state of said target within an enlarged field of view and a signal displaying a measuring mode set in advance and alarm equipment generating an alarm depending on the matching between deflection direction of a target or a set-up mode and the state of a target in accordance with said operation processing unit.

4,682,222

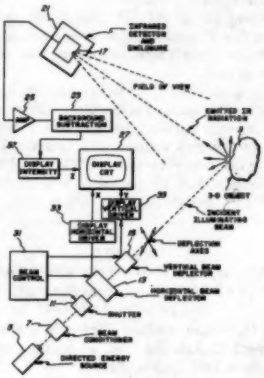
STIMULATED SCANNING INFRARED IMAGING SYSTEM

Daniel P. Smith, Ballston Spa, and Robert D. Lillquist, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1985, Ser. No. 804,725

Int. Cl.[4] H04N *5/33*

U.S. Cl. 358—113 **2 Claims**



1. A stimulated scanning infrared imaging system for scanning object surfaces comprising:

a directed energy source for providing a collimated illuminating beam;

illuminating beam deflection means for controlling illuminating beam movement over the surface of the object to be imaged;

infrared detection means for providing a signal proportional to the intensity of the infrared radiation from the object scanned by said directed energy source;

image recording means including means for recording image intensity coupled to said infrared detection means and means for controlling the position at which said image intensity is recorded; and

beam control means coupled to said illuminating beam deflector means and said means for controlling the position at which said image intensity is recorded, for synchronously driving said illuminating beam and said means for controlling the position at which said image intensity sis recorded, to provide an infrared image of the surface scanned, the ratio of said illuminating beam movement to the synchronized control of the position at which said image is recorded, controlling image magnification.

4,682,223

DESCRAMBLER UNIT METHOD AND APPARATUS FOR TELEVISION SIGNAL DESCRAMBLING

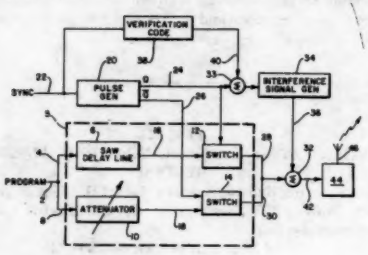
Lawrence H. Ragan, Dallas; Clinton S. Hartmann, Carrollton, and Darrell L. Ash, Garland, all of Tex., assignors to R. F. Monolithics, Inc., Dallas, Tex.

Filed Oct. 31, 1983, Ser. No. 547,027

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] H04N 7/167; G06K 19/06; G06F 7/04

U.S. Cl. 380—16 23 Claims



1. A method of descrambling received RF TV signals with transmitted synchronization signals for use in a video display receiver comprising the steps of:

a. providing partial RF TV signal descrambling circuitry having first terminals for receiving said scrambled RF TV signals and second terminals coupled to said video display receiver; and

b. coupling an electronic ticket containing the balance of said RF TV signal descrambling circuitry to said partial descrambling circuitry for forming a complete descrambling unit which utilizes said synchronization pulses to descramble said received RF TV signal and couples said descrambled RF TV signal to said second terminals for transfer to said video display receiver.

4,682,224

SYSTEM, METHOD, AND APPARATUS FOR TELEVISION SIGNAL SCRAMBLING AND DESCRAMBLING

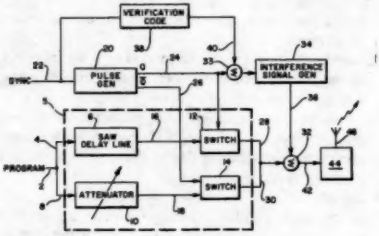
Lawrence H. Ragan, Dallas; Clinton S. Hatmann, Carrollton, and Darrell L. Ash, Garland, all of Tex., assignors to R. F. Monolithics, Inc., Dallas, Tex.

Filed Oct. 31, 1983, Ser. No. 547,070

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] H04N 7/16; G06K 19/06; G06F 7/04

U.S. Cl. 380—16 16 Claims



1. A method of providing intelligible RF TV signals to selective video receivers comprising the steps of:

a. transmitting a scrambled RF TV program signal to multiple video receivers;

b. providing an electronic ticket to viewers for a particular TV program as desired, said ticket producing a descrambled signal to a video receiver and having descrambling circuitry therein for descrambling said RF TV signal;

c. verifying the validity of said ticket for a particular TV program; and

d. command destructing any ticket not verified as valid.

4,682,225

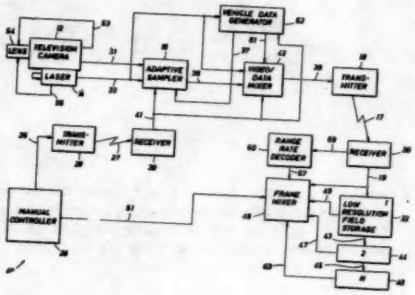
METHOD AND APPARATUS FOR TELEMETRY ADAPTIVE BANDWIDTH COMPRESSION

Olin L. Graham, Pearland, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 13, 1985, Ser. No. 775,990

Int. Cl.[4] H04N 7/12, 7/18

U.S. Cl. 358—133 14 Claims



1. A system for producing a display of an image of an object comprising:

imaging means for deriving a video signal corresponding to said object;

adaptive sampler means for sampling said video signal at a sampling rate and sequentially deriving a plurality of sampled low-resolution fields;

first transmitter means for transmitting said fields;

first receiver means for receiving said transmitted fields;

field storage means for storing said received fields;

monitor means for simultaneously displaying an electronic image of a preselected number of said stored fields;

controller means for generating a control signal, wherein said control signal varies as a function of the range or range rate of said object relative to said imaging means and wherein said system further includes means for varying the number of said preselected stored fields simultaneously displayed by said monitor means in response to said control signal.

4,682,226

MONOSTABLE MULTIVIBRATOR FOR VIDEO DISPLAY

Joseph Kadlec, Berwyn, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 20, 1984, Ser. No. 632,778

Int. Cl.[4] H04N 5/04

U.S. Cl. 358—148 8 Claims

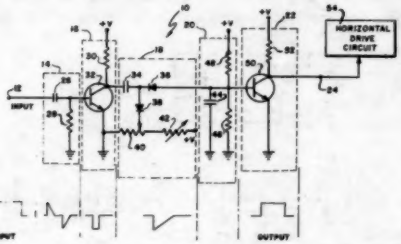
1. A variable, non-feedback type monostable multivibrator responsive to an input signal for generating an output signal in a predetermined time relation thereto, said variable monostable multivibrator comprising:

differentiation means responsive to said input signal for generating a trigger pulse in response thereto;

pulse width control means and a chargeable timing means having a characteristic time constant coupled to said differentiation means and responsive to said trigger pulse

for generating a charging pulse, wherein said control means includes means for adjusting the pulse width of said charging pulse; and

output means for receiving said charging pulse from said



timing means and for generating said output signal in said predetermined timed relation to said input signal wherein the duration of said output signal is controlled by the pulse width of said charging pulse rather than the characteristic time constant of said timing means.

4,682,227

DIGITAL VIDEO SIGNAL PROCESSING APPARATUS FOR PROVIDING ZOOM AND COMPRESSIVE IMAGES WITH SOFT FOCUS

Atma Heerah, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

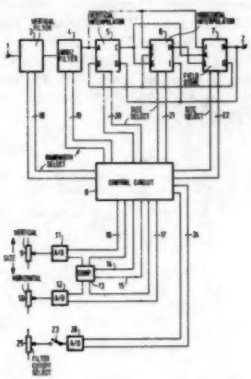
Filed Apr. 8, 1985, Ser. No. 721,252

Claims priority, application United Kingdom, Apr. 26, 1984, 8410707

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.⁴ H04N *5/262*

U.S. Cl. 358—160 **7 Claims**



1. A video signal processing apparatus for television signals encoded in digital form comprising a horizontal interpolator, a vertical interpolator, a field store, at least one of a horizontal or a vertical low pass filter for filtering the input video signal before application to the horizontal and vertical interpolators and the field store, and means for reducing the cut-off frequency of at least one of a horizontal or vertical filter as the picture size is reduced in the horizontal or vertical direction, further including means for reducing the cut-off frequency of the horizontal or vertical filter to a frequency which is less than the bandwidth of the input video signal independent of the picture size when the production of a soft focus effect is desired.

4,682,228

COLOR VIDEO DISPLAY APPARATUS FOR VEHICLES

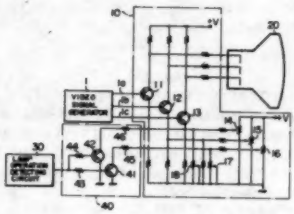
Noriyoshi Ando; Hajime Mikuni; Mitsuru Matsunaga, all of Kariya; Naoki Horie, Chita, and Tomohisa Kishigami, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 14, 1985, Ser. No. 765,525

Claims priority, application Japan, Aug. 29, 1984, 59-181562

Int. Cl.⁴ H04N *5/58*

U.S. Cl. 358—161 **7 Claims**



1. A color video display apparatus for a vehicle comprising:

video signal generator means for generating at least blue and red video signals for providing a color display;

amplifying means for amplifying said video signals from said video signal generator means, said amplifying means including gain adjusting means for varying an amplification factor of at least one of said video signals;

display means for producing said color display with said video signals amplified by said amplifying means;

light/dark detecting means for detecting one of a light and dark condition outside of said vehicle; and

control means, responsive to said detecting means detecting that the outside of said vehicle is dark, for controlling the operation of said gain adjusting means such that the amplification factor of said red video signal is increased relative to that of said blue video signal in said amplifying means to maintain stable color tones in said color display.

4,682,229

CONTROLLING THE GREY LEVELS REPRESENTED BY A VIDEO SIGNAL

Philip V. Coates, Sunbury-on-Thames, and Brian J. Eaton, Staines, both of England, assignors to Emi Limited, Hayes, England

Filed Sep. 19, 1980, Ser. No. 189,934

Claims priority, application United Kingdom, Sep. 21, 1979, 7932777

Int. Cl.⁴ H04N *5/14, 5/208*

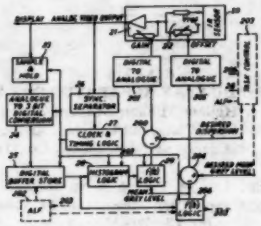
U.S. Cl. 358—166 **18 Claims**

1. A method of controlling the grey levels represented by a video signal indicative of a plurality of pixels forming a representation of a scene comprising the steps of

determining the mean grey level of a portion, at least of the video signal representing a corresponding part of the scene,

determining the value of an indication of a dispersion, relative to said mean level of grey levels exhibited by the pixels representing said part,

comparing the determined values with corresponding desired values, and



varying the video signal to reduce differences between the determined and desired values.

4,682,230

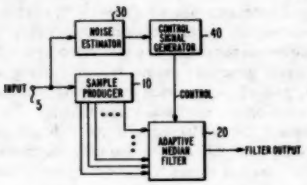
ADAPTIVE MEDIAN FILTER SYSTEM

Stuart S. Perlman, Princeton Township, Mercer County; Sanford Eisenhandler, East Windsor; Paul W. Lyons, Plumstead Township, Ocean County, and Michael J. Shumila, Hamilton Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1986, Ser. No. 842,644

Int. Cl.[4] H04N *5/21*

U.S. Cl. 358—167 **8 Claims**



1. An adaptive median filter system, comprising:

a source of an input signal possibly including noise;

means responsive to said input signal for producing successive sets of samples representing said input signal;

means for adaptively median filtering said samples responsive to control signal;

means responsive to said input signal for estimating the relative density of said noise; and

means responsive to said estimated noise density for generating said control signal.

4,682,231

BRIGHTNESS AND CONTRAST ADJUSTING APPARATUS

Yoshifumi Yamakawa, Shinagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00352, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO86/00483, PCT Pub. Date Jan. 16, 1986

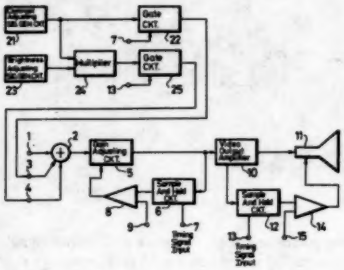
PCT Filed Jun. 21, 1985, Ser. No. 832,720

Claims priority, application Japan, Jun. 21, 1984, 59-128114

Int. Cl.[4] H04N *5/58*

U.S. Cl. 358—168 **5 Claims**

1. A brightness and contrast adjusting apparatus, which is characterized in that the apparatus comprises an inserting circuit for inserting first and second reference signals to a video signal, a variable amplifier for amplifying said references inserted video signal, a gain adjusting circuit for detecting said first reference signal from an output of said variable amplifier and for adjusting a gain of said variable amplifier such that a magnitude of said detected first reference signal becomes equal to a predetermined value, a circuit for supplying the outlet of said variable amplifier to a cathode ray tube, a brightness adjusting circuit for detecting said second reference signal from said supplying circuit and for adjusting a brightness of



said cathode ray tube in response to a magnitude of said detected second reference signal, an adjusting circuit for varying levels of said first and second reference signals, and a constant multiplier circuit for making the level of said second reference signal equal to a constant multiple of the level of said first reference signal.

4,682,232

CAPACITOR COUPLED CIRCUIT

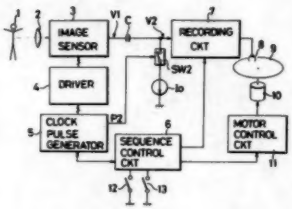
Tsutomu Takayama; Seiji Hashimoto; Toshio Kaji; Masao Suzuki, and Akihiko Tojo, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,843

Claims priority, application Japan, Oct. 11, 1984, 59-211485

Int. Cl.[4] H04N *5/16, 5/18*

U.S. Cl. 358—172 **18 Claims**



1. A capacitor coupled circuit comprising:

(a) instructing means for instructing said capacitor coupled circuit to start an operation;

(b) a coupling capacitor disposed in a signal line;

(c) a current source circuit for flowing a predetermined level of current into or out of said coupling capacitor; and

(d) a timing signal producing circuit for producing a timing signal to said current source circuit in such a manner that said coupling capacitor is made to effect a charging or discharging by said current source circuit in synchronism with the instruction action of said instructing means.

4,682,233

VIDEO OUTPUT SIGNAL CLAMPING CIRCUIT

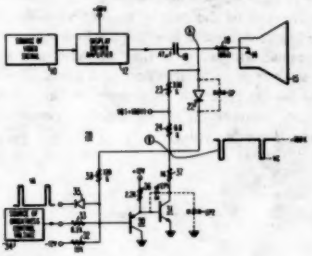
Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed May 29, 1986, Ser. No. 868,084

Claims priority, application United Kingdom, Oct. 1, 1985, 8524199

Int. Cl.[4] H04N 5/18

U.S. Cl. 358—173 9 Claims



1. In a system for processing a video signal having image and blanking intervals, said system including an image display device for displaying video information in response to a video signal applied to an intensity control electrode thereof, and a display driver amplifier, video signal clamping apparatus comprising:

a capacitor for AC coupling a video signal from an output of said display driver amplifier;

a video signal path for coupling said video signal from said capacitor to said intensity control electrode;

a switching network including a switching device having an input electrode and an output electrode having an associated parasitic capacitance, and including a feedback path coupled from said output electrode to said input electrode of said switching device;

a semiconductor clamping device having a first electrode coupled to said video signal path and a second electrode coupled to a point in said feedback path of said switching network, said clamping device being rendered conductive during said blanking interval and nonconductive during said image interval in response to conductive and nonconductive states of said switching means, respectively; and

a decoupling impedance, included in said feedback path, connected between said second electrode of said clamping device and said output electrode of said switching means, for decoupling said parasitic capacitance associated with said output electrode of said switching device from said point in said feedback path.

4,682,234

VIDEO NOISE REDUCTION IN PICTURE-IN-PICTURE TELEVISION RECEIVER

Saiprasad V. Naimpally, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

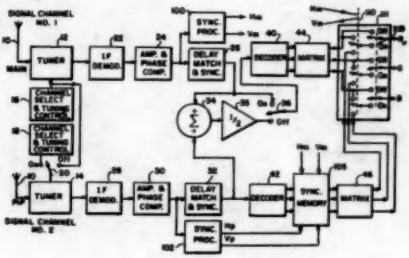
Filed Dec. 31, 1985, Ser. No. 815,347

Int. Cl.[4] H04N 5/262, 9/64

U.S. Cl. 358—183 6 Claims

1. In a television receiver having display means, first and second tuning means for tuning in a first and second selected one of a plurality of television channels, respectively, processing means coupled to said first and said tuning means for processing first and second television signals received on said first and second selected channels, respectively and for applying processed first and second television signals to said display means to create a first and second television picture, respectively, said television receiver further having user-operable selector switch means having an "on" position signifying desired dislay of both and first and said second television picture and an "off" position signifying desired display of said first television picture only, and output selector means for applying only said first television signals to said display means when said selector switch means is in said "off" position, noise reduction means comprising

means coupled to said selector switch means for automatically tuning said second tuning means to said first selected television channel when said selector switch means is in said "off" position;



combining means connected to said processing means for generating combined signals corresponding to a predetermined combination of said first and second television signals; and

additional selector means connected to said combining means and said processing means for substituting said combined signals for said first television signals when said user operable selector switch means is in said "off" position.

4,682,235

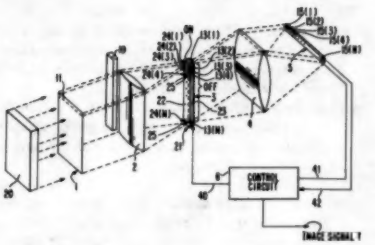
ORTHO-LINEAR IMAGING DEVICE

Samuel B. Chism, Jr., Houston, Tex., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Oct. 18, 1985, Ser. No. 789,055

Int. Cl.[4] H04N 3/12

U.S. Cl. 358—212 10 Claims



1. An apparatus for converting a two-dimensional image that has been divided into several imaginary image line segments into electronic form, comprising:

a linear array of photodetectors for converting light received from the image into electronic signals;

an image lens situated between the image and the array for focusing each image line segment onto the array;

a light modulator interposed between the image and the image lens for selectively permitting the illumination of the image lens with light received from one of the image line segments; and

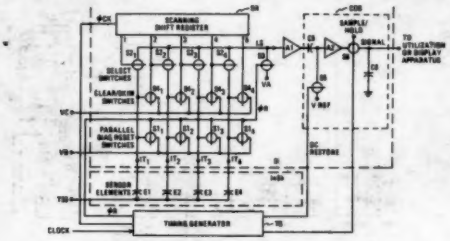
an object lens positioned between the image and the light modulator for focusing the two-dimensional image onto the light modulator.

4,682,236

READ AND CLEAR READOUT CIRCUIT AND METHOD OF OPERATION OF AN IR SENSING CHARGE INJECTION DEVICE

Samuel C. Wang, Liverpool; John M. Swab, Baldwinsville; Michael L. Winn, Liverpool, and Martin D. Gibbons, Camillus, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,474
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.26 **8 Claims**



1. In a charge injection device (CID) for optical sensing eliminating readout circuit lag, the combination comprising

A. n optical sensor elements (E_{1-n}) arranged in an array on a substrate, each element equivalently representable by a capacitor, diode, and battery network, which when reversely biased to a suitable voltage (VB) forms a potential well in which bias charges are maintained, and as a function of optical irradiance, photon induced signal charges are stored, and

B. a readout circuit comprising

(1) n input terminals ($IT_{1, 2, 3 \ldots n}$) each connected to one of said n sensor elements $E_{(1-n)}$, a node including a sensing line, and a signal output terminal,

(2) a first voltage source (VB) and n controllable reset switches ($S1_{1, 2, 3 \ldots n}$), for periodically biasing said sensor elements to said charge storing voltage (VB),

(3) amplification means (A1) having the input thereof coupled to said node, said node exhibiting a capacitance, and an output

(4)

(i) a second voltage source (VA) having a value selected to remove charge from said potential wells and

(ii) a reset switch (S3) for periodically resetting said node to said second voltage,

the resetting of said sensor elements and said node to said first and said second voltages, respectively, occurring simultaneously as the first step in the readout sequence of each sensor element,

(5)

(i) a third voltage source (VC) having a value selected to remove signal charge remaining in the wells after readout or in excess of said value to skim the bias charge, and

(ii) n controllable clear/skim switches ($S4_{1, 2, 3, \ldots n}$) for periodically clearing or clearing and skimming each sensor element

(6) timing means including

(i) a scanning shift register providing an output establishing successive sensor readout intervals and successive clearing or clearing and skimming intervals, and

(ii) n element select switches ($S2_{1, 2, 3 \ldots n}$) controlled by said register for connecting successive sensor elements for readout to said node to inject the charges stored in said wells into the substrate as the voltage at said node and the selected sensor element equalize at a voltage dependent on optical intensity, said injection being the second step in the sensor readout sequence,

the (jth) timing means output being coupled to the jth select switch for defining the readout interval for the jth sensor and to a prior (e.g. (j−1)th) clearing or clearing and skimming switch for causing clearing or clearing and skimming operation on said prior (e.g. (j−1)th) sensor element, and thereby clearing or clearing and skimming each sensor element after readout on the following sensor readout interval, and

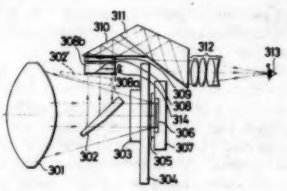
(7) a correlated double sampling circuit whose input is connected to the output of said amplification means, and whose output is connected to said signal output terminal for taking a first voltage sample following reset, but prior to injection, and a second voltage sample during injection, the readout value for the selected sensor representing the difference between said first and second sample voltages.

4,682,237

PHOTOGRAPHIC OPTICAL APPARATUS

Masatake Kato, Tokyo; Tetsuharu Nishimura, and Hideo Yokota, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Filed May 1, 1985, Ser. No. 729,293
Claims priority, application Japan, May 7, 1984, 59-90765; Jun. 20, 1984, 59-126825; Aug. 24, 1984, 59-176463; Aug. 27, 1984, 59-179059; Dec. 27, 1984, 59-280576
Int. Cl.[4] H04N *5/225*; G02B *13/16*
U.S. Cl. 358—225 **28 Claims**



1. A photographic optical apparatus comprising:

(a) optical path selecting means for selecting one of two optical paths of an objective optical system;

(b) image receiving means arranged in one of the two optical paths to receive an image of said objective optical system and produce a video signal;

(c) optical filtering means arranged between said optical path selecting means and said image receiving means to apply optical filtering to an image to be received by said image receiving means;

(d) optical directing means arranged on the other of said optical paths to change the direction of said other optical path;

(e) a predetermined image plane lying in between said optical path selecting means and said optical directing means;

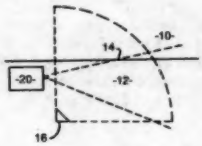
(f) an eyepiece for observing said predetermined image plane through said optical directing means; and

(g) optical correcting means for correcting the image performance due to said objective optical system, arranged in a space between said optical path selecting means and said predetermined image plane and having an optical path length which is substantially equal to the optical path length of said optical filtering means.

4,682,238
ENERGY-EFFICIENT LIGHTING SYSTEM FOR TELEVISION

Duane C. Cawthorne, Amarillo, Tex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 823,546
Int. Cl.⁴ H04N *5/238*
U.S. Cl. 358—228 **9 Claims**



1. A television light intensity control system for a viewing area subjected to natural and controlable artificial light comprising:

a television camera comprising:

transducer means for converting light from the viewing area to an first signal representative of the intensity of the light; and

an optical system for transmitting light from said viewing area into said camera, said system including optical control means for automatically controling from a maximum value to a minimum value the ratio of light passing from said optical system to light incident upon said optical system;

lamp means for providing the artificial light over the viewing area; and

lamp control means for using the first signal from said transducer means to control the intensity of artificial light from said lamp means to provide only sufficient artificial light as needed to keep the total of artificial and natural light leaving said optical system at a constant intensity, said artificial light being provided while the ratio of said optical control means is a substantually maximum value, said constant intensity being sufficient for said camera to generate a television video signal representative of a satisfactory television picture.

4,682,239
VERY LARGE VIDEO DISPLAY APPARATUS WHICH CAN BE CONSTRUCTED OF A NUMBER OF MODULAR UNITS

Yuji Watanabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 8, 1985, Ser. No. 689,599
Claims priority, application Japan, Jan. 13, 1984, 59-5389; Jan. 27, 1984, 59-13877
Int. Cl.⁴ H04N *3/14, 5/70*
U.S. Cl. 358—241 **7 Claims**

7. A video display system comprising:

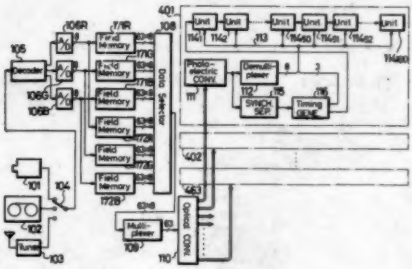
a video display source for supplying a video signal;

a plurality of units arranged to form a display device,

each of said units including a plurality of display cells arranged in an X-Y matrix form; and

driving means for supplying said video signal to said units; characterized in that

said driving means supplies the video signal to said units in a manner that the display cells included in one unit are supplied with the video signal in succession to complete a whole display of said one unit and the display cells included in a neighboring unit are then supplied with the

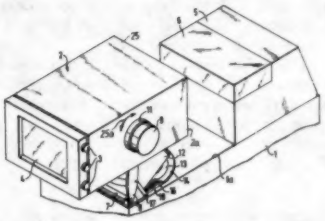


video signal to complete a whole display of said neighboring unit so that interlaced scanning of said units occur.

4,682,240
INTERLOCKED TELEVISION CAMERA AND ELECTRONIC VIEWFINDER COMBINATION

Horst Bachmann, Reinheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,568
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520457
Int. Cl.⁴ G03B *13/10*
U.S. Cl. 358—224 **20 Claims**



1. Television camera and electronic viewfinder combination, in which the television camera (**1**) has a camera housing formed with an essentially flat top surface (**1***a*) and a tower block (**5, 6**) projecting upwardly from the top surface;

an electronic viewfinder (**2**) of essentially block structure;

first securing means (**8, 12**) for securing said electronic viewfinder to the top surface (**1***a*) of the camera housing for pivotal movement about a horizontal axis (**7**) located close to said top surface, to permit pivoting of the electronic viewfinder between a rest position close to the top surface of the TV camera and a working position remote from the top surface;

and second securing means (**13, 14**) for mounting the electronic viewfinder for rotary movement about a vertical axis (**13***a*),

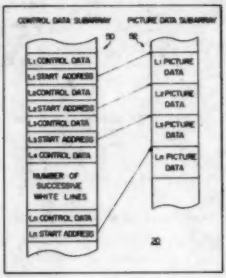
and comprising, in accordance with the invention,

means for preventing rotary movement of the electronic viewfinder (**2**) unless the viewfinder block structure is pivoted away from its rest position and into the working position, including means (**16, 17, 18, 27, 28**) for interlocking the first securing means (**8, 12**) and the second securing means (**13, 14**) and for preventing movement about both the horizontal axis (**7**) and the vertical axis (**13***a*) when the viewfinder is not moved from its rest position into the working position.

4,682,241
DATA TRANSFER SYSTEM

Eiichi Adachi, Tokyo, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,842
Claims priority, application Japan, May 28, 1984, 59-108030
Int. Cl.[4] H04N *1/419*
U.S. Cl. 358—261 3 Claims



1. A data transfer system wherein a common bus is used comprising

first means operative to successively produce pieces of information each consisting of a limited number of data bits, said pieces of information including those having a predetermined nature,

second means responsive to said pieces of information produced by said first means and operative to discriminate pieces of information having said predetermined nature from other pieces of information,

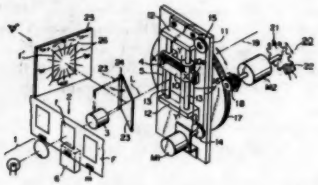
third means for counting the pieces of information having said predetermined nature when such pieces of information occur successively, and

fourth means responsive to encode the successively occurring pieces of information having said predetermined nature into a single piece of information including a code indicating the predetermined nature and a code indicating the number of the successively occurring pieces of information having said predetermined nature.

4,682,242
APPARATUS FOR IMAGE POSTURE CORRECTION

Yasutoshi Sugita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 773,220, Sep. 6, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 939,227
Claims priority, application Japan, Oct. 1, 1984, 59-205977
Int. Cl.[4] H04N *1/12*; G03B *27/70*
U.S. Cl. 358—285 20 Claims



1. An apparatus for correcting a posture of an image comprising:

an image sensor;

optical means for projecting an image onto said image sensor;

monitoring means for monitoring the image projected by said optical means;

correction means for relatively correcting an error of posture of the projected image relative to said image sensor;

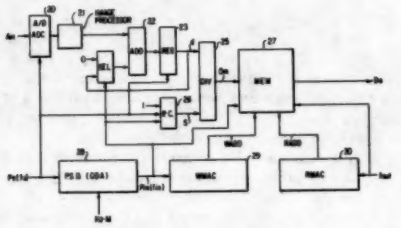
input menas for inputting a value corresponding to a deflection of the image monitored by said monitoring means with respect to a reference position; and

control means for controlling said correcting means in response to the input value so as to cause the posture of the image projected onto said image sensor to become appropriately corrected.

4,682,243
MAGNIFICATION RATIO CONVERSION IN IMAGE REPRODUCTION

Fumihiro Hatayama, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1985, Ser. No. 716,686
Claims priority, application Japan, Mar. 30, 1984, 59-64657
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—287 9 Claims



1. A method for controlling image magnification ratio in an electronic image reproduction system, comprising the steps of:

(a) scanning an original image;

(b) sampling the original image in synchronism with a sampling pulse signal of a constant frequency f_s independent of a predetermined magnification ratio to obtain corresponding digital image data;

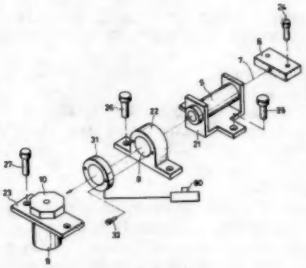
(c) averaging the digitized image data among a number of pixels corresponding to the magnification ratio; and

(d) writing the image data obtained in step (c) into a memory device, the writing being synchronized with a writing pulse signal of a frequency $f_{in}=K_2.M.f_s$, wherein K_2 is a constant and M is the magnification ratio.

4,682,244
OPTICAL RECORDING DEVICE

Yoshiyuki Ishitate, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,537
Claims priority, application Japan, Nov. 7, 1984, 59-233337
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—287 5 Claims



1. An optical recording device for printing scanned images as a whole at a predetermined scale size comprising:

a beam oscillator for producing a beam;

scanning means for line-scanning the beam produced by the beam oscillator;

means for receiving the line-scanned beam in the form of a scanned spot and for recording an image formed by the scanned spot; and

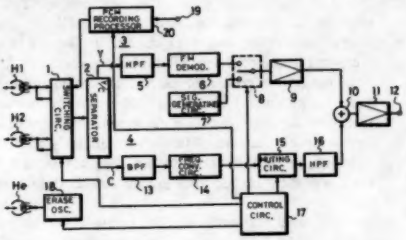
aperture means for varying the size of said line-scanned beam and thereby varying the size of printing dots formed by said scanned spot to enhance resolution of a printed scaled image.

4,682,245

VIDEO AND AUDIO SIGNAL RECORDING, REPRODUCING AND EDITING APPARATUS WITH REPLACEMENT OF VIEWED LUMINANCE SIGNAL COMPONENT DURING INSERT AUDIO EDITING MODE

Masahiro Shibata; Tatsuo Tsujibayashi, both of Tokyo; Hiroyuki Sato, Kanagawa, and Yoshinori Machida, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,861
Claims priority, application Japan, Jun. 18, 1985, 60-132639
Int. Cl.[4] H04N *5/782, 5/91, 9/79*
U.S. Cl. 358—311 **7 Claims**



1. An apparatus for recording and reproducing a color video signal and an audio signal in respective areas of successive slant tracks on a record tape, said apparatus comprising:

first and second rotary heads attached to a rotary drum for recording and reproducing said color video and audio signals in alternate slant tracks on the tape wrapped about said drum; playback circuit means for processing luminance and chrominance components of said color video signal reproduced by said first and second rotary heads; audio circuit means for supplying an audio signal to said rotary heads to be recorded; signal generator means for generating a predetermined substitute signal; muting means for muting the processed chrominance component; and control means for replacing said processed luminance component by said substitute signal from said signal generator means and for operating said muting means to mute said processed chrominance component while said audio signal is recorded to replace a previously recorded audio signal.

4,682,246

CHARACTERIZING THE INFORMATION TRANSFER CHARACTERISTICS OF A RECORDING MEDIUM

Edward Efron, Irvine; James O. McPherson, Newport Beach, and Young B. Kim, Long Beach, all of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 339,011, Jan. 12, 1982. This application Sep. 30, 1982, Ser. No. 429,349
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.[4] H04N *17/06;* **G11B** *27/36*
U.S. Cl. 358—335 **5 Claims**

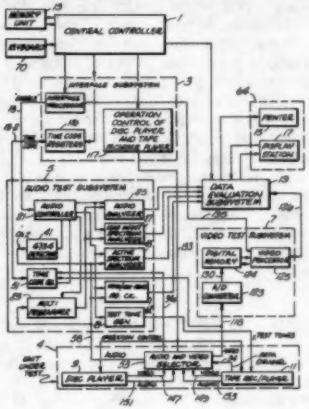
1. A method of analyzing the signal transferring characteristics of a video signal processing unit comprising the steps of:

(a) establishing an input video test signal of known content;

(b) measuring selected parameters of selected parts of said video input test signal;

(c) feeding said video input test signal to said signal processing unit;

(d) measuring said parameters of parts of the output signal from said signal processing unit corresponding to said selected parts of said input signal; and



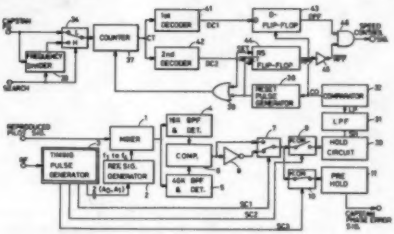
(e) comparing said selected parameters of said input signal with the corresponding parameters of said output signal.

4,682,247

TAPE SPEED DETERMINING APPARATUS FOR VIDEO SIGNAL REPRODUCING APPARATUS

Nobuhide Doutsubo, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 18, 1985, Ser. No. 713,067
Claims priority, application Japan, Mar. 19, 1984, 59-52720
Int. Cl.[4] H04N *5/783;* **G11B** *15/46*
U.S. Cl. 360—10.2 **7 Claims**



1. A tape speed determining apparatus for a video signal recording/reproducing apparatus, operable at a plurality of operating speeds, using a helical scanning system in which a video signal including a plurality of fields recorded on a video tape in a slanted manner is reproduced by means of a rotating head system in which a plurality of reproducing heads which are switched by a reproducing head selection pulse are mounted on a rotating body, said video tape being recorded with a signal that is intended to be reproduced at one of said plurality of operating speeds, said recording/reproducing apparatus using a pilot signal system wherein a plurality of pilot signals recorded with said video signal in an overlapping manner are reproduced and wherein reference signals are supplied with predetermined timing, said tape speed determining apparatus comprising:

timing pulse generator means for deriving timing pulses in response to said reproducing head selection pulse, including means for generating timing pulses that last for an infinitesimal period of time, and delay means for delaying

by said period of time selection of reference signals from among said reference signals;

error signal detecting means for detecting, during said infinitesimal period of time, an error signal generated by comparison of the levels of two beat frequencies of said pilot signals, said error signal being sampled by said timing pulses and converted to a pulsed waveform representative of amplitudes of a sequence of said error signals the polarity of which is inverted for alternate fields;

low pass filter means for deriving from said pulsed waveform a fundamental wave; and

means for determining from the frequency and waveform of said fundamental wave whether an operating speed at which said fundamental wave is produced is the intended reproduction speed of said video signal and for providing a signal indicative of said determination.

4,682,248

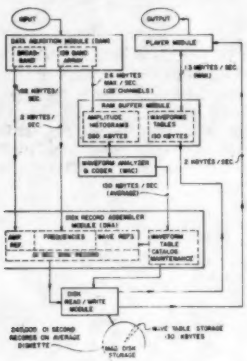
AUDIO AND VIDEO DIGITAL RECORDING AND PLAYBACK SYSTEM

David M. Schwartz, Englewood, Colo., assignor to CompuSonics Video Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 651,111, Sep. 17, 1984, which is a continuation-in-part of Ser. No. 486,561, Apr. 19, 1983, Pat. No. 4,472,747. This application Sep. 17, 1985, Ser. No. 776,809

Int. Cl.[4] G11B *5/00*; G10L *5/02*

U.S. Cl. 360—32 **3 Claims**



1. A microcomputer recording system for recording analog audio and video signals in digital data form comprising:

converting means for converting an analog audio signal into a multiplicity of digital data streams wherein at least one of said data streams is a relatively broadband reference signal representative of the amplitude of a preselected range of audio frequencies, and wherein another of said data streams is produced by filtering the analog audio signal to produce a data stream channel indicative of a plurality of discrete frequencies encompassed by the bandwidth represented by the first data stream; and

wherein another of said digital data stream is a reference signal representative of the amplitude of the audio signal for each of plurality of discrete frequencies;

sampling means for producing a sequential stream of samples in each of said digital data streams,

selection means for selecting a predetermined portion of the digital data samples produced by said sampling means in each digital data stream;

means for separately storing each of said selected data samples produced by said sampling means;

means for comparing the reference data stream containing amplitude data with the reference data stream containing frequency data to produce frequency spectrogram data representative of the frequency and energy of the original audio signal;

means for comparing said histogram data with selected waveform parameters and producing addressable data representative of the waveform of the original input data;

means for sequentially assembling and storing the frequency spectrogram data and the amplitude reference data and the addressable waveform data for subsequent use; and

converting means for converting an analog video signal into a multiplicity of digital data streams wherein the first of said digital data streams is a sequential time code representative of the beginning of each video frame, and

wherein another of said digital data streams is produced by filtering the analog time domain signal to produce a data stream channel indicative of chrominance; and

wherein another of said data streams is indicative of brightness; and

wherein another of said digital data streams is indicative of pixel spatial relationships; and

wherein another of said data streams is indicative of the temporal frame to frame relationships; and

coding means for receiving each data stream individually, said coding means including means for mathematically transforming each digital data stream into modified data streams each capable of being subsequently analyzed by comparison of the chrominance, brightness and spatial factors present respectfully in said modified data streams, and

means for selecting predetermined data bits from each of said modified data streams after comparison, in a sufficient amount to reconstruct each chrominance, brightness and spatial factors for video presentation, and

means for storing said digital data bits for retrieval.

4,682,249

METHOD OF DOCUMENTATING AN INVENTORY, AND A SEALING MECHANISM FOR USE THEREWITH

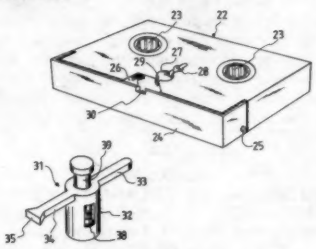
Kurt Andréasson, Postlada 973, Bollebygd, Sweden (51700)

Filed Apr. 18, 1985, Ser. No. 724,414

Claims priority, application Sweden, Apr. 19, 1984, 8402203

Int. Cl.[4] H04N *5/782*; G11B *33/00*

U.S. Cl. 360—33.1 **13 Claims**



1. A sealing mechanism to prevent tampering for a magnetic tape cassette of the type wherein a casing is provided with a cylindrical passage having at least one opening in its envelope wall, said mechanism, comprising:

a body adapted for introduction into said cylindrical passage and having at least one projecting lip for engagement with said envelope wall of said opening;

protruding members interconnected by a fragile portion to said body so located that a removal of a fitted mechanism is impossible until said protruding members have been separated; and

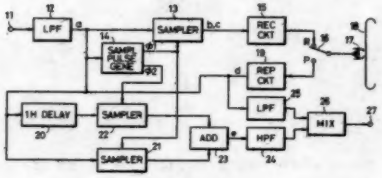
at least one arm extending sidewardly from said body and a member means for gripping a lid of said cassette.

4,682,250

APPARATUS FOR RECORDING A VIDEO SIGNAL SAMPLED AT FREQUENCY F_s AND REPRODUCING THE VIDEO SIGNAL AS A SIGNAL ESSENTIALLY SAMPLED AT FREQUENCY $2F_s$

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 13, 1984, Ser. No. 620,016
Claims priority, application Japan, Jun. 15, 1983, 58-107379
Int. Cl.[4] H04N 5/78, 9/491, 5/91
U.S. Cl. 360—33.1 6 Claims



1. An apparatus for recording and reproducing a video signal on and from a recording medium, said video signal being accompanied by synchronizing signals but not by other multiplexed signals, said apparatus comprising:

a sampling pulse generator supplied with a video signal, for producing sampling signals ϕ_1 and ϕ_2 which are in phase with a horizontal synchronizing signal of the video signal and mutually differ in phase by 180°, each of said sampling signals ϕ_1 and ϕ_2 having a frequency f_s which satisfies an equation

$$f_s=(2n+1)f_H/2,$$

where n is and integer anf f_H is a horizontal scanning frequency of the video signal;

first sampling means for sampling a recording video signal which is to be recorded by the sampling signal ϕ_1 which is produced by said sampling pulse generator when said sampling pulse generator is supplied with said recording video signal, said recording video signal having a band with an upper limit frequency f_a, said frequencies f_a and f_s satisfying a relation $f_a<f_s<2f_a$;

recording and reproducing means for recording an output signal of said first sampling means on the recording medium and for reproducing the signal from the recording medium;

delay means for delaying a reproduced video signal which is reproduced from the recording medium by said recording and reproducing means by a delay time of one horizontal scanning period;

second sampling means for alternately sampling input and output signals of said delay means by the sampling signals ϕ_1 and ϕ_2 which are produced by said sampling pulse generator when said sampling pulse generator is supplied with said reproduced video signal, said second sampling means comprising a first sampler for sampling the input signal of said delay means by the sampling signal ϕ_1, and a second sampler for sampling the output signal of said delay means by the sampling signal ϕ_2; and

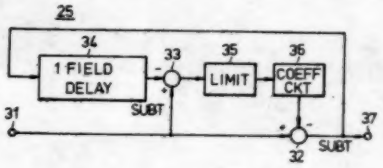
adding means for adding alternately sampled signals from said second sampling means, and for obtaining a reproduced output signal which has essentially been sampled at a frequency of $2f_s$.

4,682,251

VIDEO SIGNAL REPRODUCING APPARATUS HAVING A NOISE REDUCTION CIRCUIT

Akira Hirota, Chigasaki, and Takuya Tsushima, Ayase, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 20, 1985, Ser. No. 713,787
Claims priority, application Japan, Mar. 21, 1984, 59-53997; Mar. 21, 1984, 59-53998; Mar. 21, 1984, 59-53999
Int. Cl.[4] H04N 5/91
U.S. Cl. 360—33.1 12 Claims



1. A video signal reproducing apparatus comprising:

reproducing means for reproducing from a recording medium a pre-recorded video signal, said pre-recorded video signal having field correlation and having a predetermined band; and

a noise reduction circuit supplied with a reproduced video signal from said reproducing means for essentially reducing noise included within the reproduced video signal,

said noise reduction circuit comprising first and second subtracting circuits supplied with the reproduced video signal from said reproducing means, a one-field delay circuit for delaying an output of said first subtracting circuit by a predetermined time period and for supplying a delayed signal to said second subtracting circuit, said predetermined time period being equal to one field or a time period which is a natural number multiple of one horizontal scanning period and is extremely close to one field, and limiter for amplitude-limiting an output of said second subtracting circuit and for supplying an amplitude limited signal to said first subtracting circuit,

said output of said first subtracting circuit being obtained as an output of said noise reduction circuit,

said one-field delay circuit having a transmission band which is narrower than a band of said reproduced video signal.

4,682,252

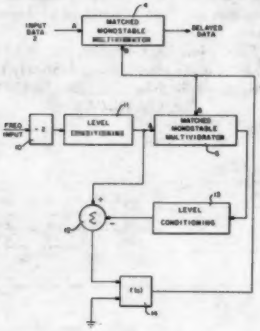
METHOD AND APPARATUS FOR EVALUATING A RECORDING SYSTEM UTILIZING A PROGRAMMABLE WINDOW GENERATOR HAVING FIRST AND SECOND MULTIVIBRATORS PROVIDING DELAY

Robert F. Smith, Santa Clara County, Calif., assignor to Seagate Technology, Scotts Valley, Calif.

Filed Dec. 2, 1985, Ser. No. 803,732
Int. Cl.[4] G11B 27/00, 5/02; H03K 5/159
U.S. Cl. 360—67 5 Claims

1. A system for evaluating a disc drive having at least one disc storing data on a plurality of tracks by comparing data read back from said disc track to the edges of a fixed window, the data being selectively read from any one of the tracks, said system comprising a first monostable multivibrator having data input coupled to receive the data read from said any one of said disc drive tracks, and delay means for modifying the data rate output of said monostable multivibrator, said delay means comprising a second monostable multivibrator having an input receiving a fixed frequency signal, the output of said second monostable multivibrator being coupled to a control input of said first monostable multivibrator for controlling the time constant of the first monostable multivibrator, whereby the period of said fixed frequency to said second monostable multi-

vibrator controls the delay of said first monostable multivibrator, the read data being delayed by varying degrees of time,



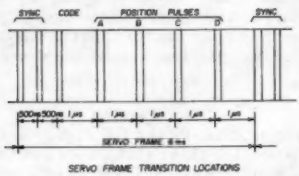
and detected within said fixed window to evaluate the error rate of said disc drive.

4,682,253

SERVO POSITIONING SYSTEM FOR DISK DRIVE SYSTEM

James B. Leslie, Rumbling Bridge, by Kinross, United Kingdom, assignor to Rodime PLC, Fife, Scotland

Filed Apr. 23, 1986, Ser. No. 854,825
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—77 **30 Claims**



SERVO FRAME TRANSITION LOCATIONS

1. A servo positioning system for operating the positioning mechanism of a disk drive having at least one disk rotating at a constant speed, transducer means associated with each surface of said at least one disk, one surface of said at least one disk containing only servo information with the remaining disk surfaces being available for data storage, and means for decoding said servo information for controlling the operation of said positioning mechanism, said servo information comprising:

a plurality of concentric tracks recorded on said servo surface, each of said concentric tracks having a like plurality of frames of a predetermined equal time period occurring over the length of each of said concentric tracks;

each of said frames including one of a plurality of different basic servo patterns each track having only a single pattern repeating thereon; and

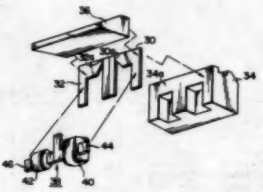
each of said frames additionally containing syncronization and coding information such that said detecting means can extract indexing and guardband information encoded on said tracks.

4,682,254

GIMBAL SPRING SUPPORTED MAGNETIC RECORDING HEAD

Shingo Hashimoto; Kazuyuki Sunaga, and Kaoru Kasugai, all of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,791
Claims priority, application Japan, Mar. 14, 1984, 59-37329[U]
Int. Cl.[4] G11B *21/20, 5/48*
U.S. Cl. 360—103 **2 Claims**



1. A magnetic recording head for a floppy disk drive which is supported by a gimbal spring comprising:

a read/write core and an erase core sandwiched between and fixedly connected to a main slider and auxiliary slider; and

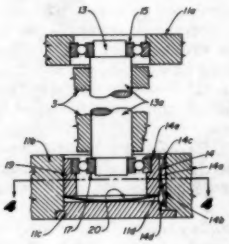
a coil assembly having back bars closely attached to said respective read/write and erase cores on which a read/write coil and an erase coil are directly wound around and fixed thereon, said read/write coil and said erase coil being provided with an axis of said read/write coil and said erase coil in parallel wtih said gimbal spring with said read/write and erase cores and said coil assembly together with said sliders being provided only on one side of the gimbal spring.

4,682,255

ACTUATOR ARM BEARING PRELOAD ARRANGEMENT FOR A ROTARY DISC DRIVE

Roger R. Sleger, Meridian, and Edward Walsh, Boise, both of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1986, Ser. No. 829,685
Int. Cl.[4] G11B *21/16, 5/55*
U.S. Cl. 360—106 **8 Claims**



1. In a rotary disc memory drive having rotatable memory disc stack and transducer heads for deriving information from the memory discs, means for supporting and moving said transducer heads bidirectionally in arcuate paths over said memory discs, comprising:

a. an actuator arm assembly mounting said transducer heads;

b. an actuator housing having upper and lower housing sections;

c. a shaft assembly pivotally mounting said actuator arm assembly between said upper and lower housing sections, for angular movement sweeping said transducer heads

bidirectionally in arcuate paths between inner and outer radial limits over said memory discs;

d. a bearing mounted adjacent each end of said shaft assembly, each having an outer ring structure, respectively fitted in said upper and lower housing sections

e. a first leaf spring of a single piece of material, having deflectable sections, compressed between the side of one outer ring structure of one bearing and the adjacent housing section for providing a side preload on said one bearing; and

f. a second leaf spring having deflectable sections disposed between the end of said one outer ring structure and the adjacent housing section for providing an axial preload on each bearing.

4,682,256

METHOD OF MANUFACTURING A COMPOSITE TYPE MAGNETIC HEAD

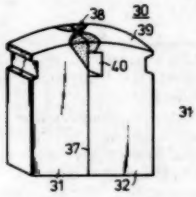
Yasuhiro Ayabe, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Oct. 28, 1985, Ser. No. 791,784

Claims priority, application Japan, Nov. 1, 1984, 59-246921

Int. Cl.[4] G11B *5/23, 5/127, 5/187*

U.S. Cl. 360—119 **6 Claims**



1. A method of manufacturing a composite type magnetic head having a contact surface for scanning a magnetic recording medium, said method comprising:

a step of forming, with a predetermined interval, first curved depressions on a first block half made of a magnetic ferrite and second curved depressions on a second block half made of the magnetic ferrite;

a step of forming a first film made of a magnetic metal material directly on at least a portion of each surface of the first curved depressions and a second film also made of said magnetic metal material directly on at least a portion of each surface of the second curved depressions;

a step of filling a glass sealing in the first and second curved depressions on top of the first and second films;

a step of lapping gap surfaces of the first and second block halves, said first and second films respectively having film thicknesses equal to a desired track width at said gap surfaces of the first and second block halves;

a step of forming third curved depressions on the first block half adjacent to the first curved depressions so that the first film is exposed for a predetermined range in a vicinity of the gap surface and fourth curved depressions on the second block half adjacent to the second curved depressions so that the second film is exposed for the predetermined range in a vicinity of the gap surface;

a step of forming a block by binding the first and second block halves together with a gap member interposed between the gap surfaces so that the film thicknesses of the first and second films coincide with each other to form a gap of the magnetic head at the contact surface, said first and second films constituting a generally S-shaped contour at the contact surface which includes said gap of the magnetic head; and

a step of slicing the block into a plurality of magnetic heads.

4,682,257

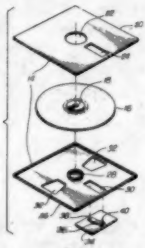
MICRO FLOPPY DISC HEAD CLEANER

Eli Neuman, Chatsworth, Calif., assignor to Perfectdata Corporation, Chatsworth, Calif.

Filed Mar. 29, 1985, Ser. No. 717,552

Int. Cl.[4] G11B *5/41, 23/02*

U.S. Cl. 360—128 **9 Claims**



9. A device for cleaning a magnetic head in a flexible disk single sided recording system using a magnetic head on one side of a disk and a pressure pad on the opposite side of the disk, said device comprising:

a cleaning disk made of an absorbant and porous material and adapted to be saturated with a cleaning fluid;

a substantially flat shell rotatably supporting said cleaning disk within its interior, said shell including two sides, a first side having a first opening for exposing said cleaning disk to a magnetic head of a flexible disk system and a second side including a pressing member attached to the inside thereof opposite said first opening, said pressing member for pressing against said cleaning disk so that said cleaning disk is pressed against said magnetic head.

4,682,258

VIDEO CASSETTE CARTRIDGE CONSTRUCTION

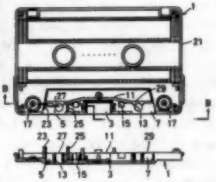
Takateru Satoh, Saku; Haruo Shiba, Komoro, and Eiichi Nunokawa, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,403

Claims priority, application Japan, Nov. 10, 1983, 58-173153[U]

Int. Cl.[4] G11B *23/04;* **G03B** *1/04*

U.S. Cl. 360—132 **3 Claims**



1. A tape cassette including an upper housing section and a lower housing section joined along peripheral meeting walls to provide a housing accommodating a magnetic tape therein, the front wall of the assembled housing having a central opening for the magnetic head of a recorder to gain entrance thereinto, two capstan openings for capstan insertion, and two pinch guide openings for pinch guide insertion, one pinch guide opening formed adjacent either side of the central opening, characterized in that said lower housing section is provided in only one of said pinch guide openings with a pair of upstanding tape guide ribs, each of said guide ribs having a front section projecting a height greater than the width of the magnetic tape

and a rear section joined to and supporting the front section of said guide ribs and having a height half the height of said front section of said guide ribs, said upper housing section is provided in the other of said pinch guide openings with a pair of similarly formed tape guide ribs, and both said housing sections are provided with partition walls at positions corresponding to and in engagement with the rear section of said respective guide ribs whereby the mating housing sections provide a magnetic tape cassette with improved dimensional accuracy and ease of mold removal during formation.

4,682,259

MAGNETIC TAPE CASSETTE WITH DUSTPROOF MECHANISM

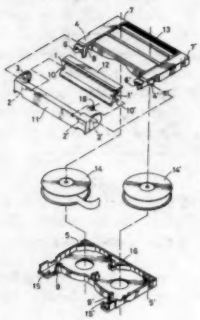
Masatoshi Okamura, Saku; Haruo Shiba, Komoro; Kenji Hashizume, and Yoshiya Sakata, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,585

Claims priority, application Japan, Aug. 15, 1984, 59-124032[U]

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—132 **3 Claims**



1. A magnetic tape cassette including:

a housing having an opened front portion and being defined by mated upper and lower parts;

a front lid pivotally mounted at the front portion for movement between an opened and closed position, said front lid normally being biased to said closed position;

an inner lid having two opposed ends and having a pivot at each end for engagement of said front lid, said inner lid being adapted for movement between an opened and closed position, when said front and inner lids are in their closed positions, a magnetic tape which is located between said lids is protected, and when said front and inner lids are in their opened positions said magnetic tape is exposed; comprises:

a coil spring having a first and second end and being fitted on one of said pivots of said inner lid, said first end being engaged with said front lid, said second end being engaged with said inner lid, such that said inner lid is normally urged to its said closed position;

a guide pin being provided on said end of said inner lid;

said housing having a groove for receipt of said guide pin;

whereby when said front lid is moved to said opened position, said guide pin of said inner lid travels in said groove thereby moving said inner lid into said opened position.

4,682,260

MAGNETIC DISK CARTRIDGE

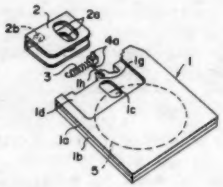
Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 16, 1984, Ser. No. 600,434

Claims priority, application Japan, Apr. 22, 1983, 58-60451[U]

Int. Cl.⁴ G11B *23/03*

U.S. Cl. 360—133 **5 Claims**



1. A magetic disk cartridge having a case and a magnetic disk rotatably housed in the case, the magnetic disk cartridge comprising:

(i) a shutter for opening and closing window sections provided in said case for insertion of a magnetic head for recording, said shutter being fitted on outer wall surfaces of said case in a manner slidable in a direction approximately normal to the depth direction of apertures of said window sections,

(ii) a spring having two ends for always urging said shutter to close said window sections, the two ends of said spring being engaged respectively with a part of said case and with a part of said shutter, and

(iii) an engagement means for engaging at least one end of said spring with said case or said shutter via an engagement member, where at least one of said two ends is integrally connected to said engagement means, and wherein said engagement member comprises a block secured to at least one end of said spring and having approximately cylindrical engagement protrusions vertically and symmetrically positioned on the upper surface and the lower surface of said block, and means disposed on said shutter or said case for resiliently receiving and holding in place said protrusions.

4,682,261

PRODUCTION CONTROL SYSTEM, ESPECIALLY FOR GARMENT MANUFACTURE

Keith Benson, Sheffield, and John McCormack, Derbyshire, both of England, assignors to Production Control Information (PCI) Limited, England

Filed May 12, 1983, Ser. No. 494,147

Claims priority, application United Kingdom, May 14, 1982, 8214090; May 14, 1982, 8214191

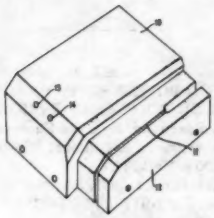
Int. Cl.⁴ G06F *1/00, 15/46*

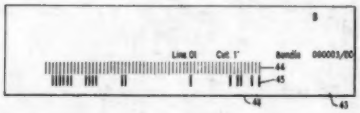
U.S. Cl. 364—468 **20 Claims**

1. An operator input device (OID) for use in a system of production or work control, comprising a card reader for scanning a card to ticket bearing encoded data when said card is placed in the card reader and generating electrical signals representative of said encoded data, a cable for supply low-voltage external electrical power to the OID over a pair of electrical lines, pulse train-generating-circuitry responsive to the card reader output signals to derive a stream of pulses of at least two different durations representing the encoded data, said pulse train-generating circuitry taking its electrical supply from said pair of lines, and short-circuiting means powered from said pair of lines and responsive to said stream of pulses to substantially reduce the ohmic resistance between said lines for a succession of time periods corresponding to the time durations of said pulses, whereby the data from the card or ticket is

transmitted by the OID on the same cable pair as suuplies the OID with its electrical power,

each said card or ticket bearing two parallel bar code tracks, the first being a clock track of regularly spaced thin bars, and the second a data track having either a thick bar or a





space opposite each thin bar bit of the clock track to indicate ones and zeroes,

said scanning means comprising a first emitter/receiver combination scanning the clock track and a second emitter/receiver combination scanning the data track.

4,682,262

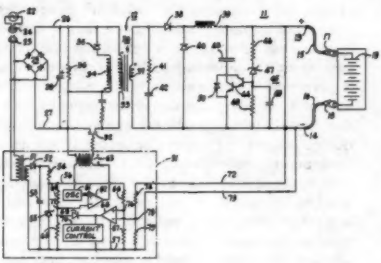
BATTERY CHARGER SPARK SUPPRESSOR

Kurt Monsell, Portville, N.Y., assignor to Acme Electric Corporation, Olean, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,344

Int. Cl.[4] H02H *7/18*

U.S. Cl. 361—6 **14 Claims**



1. A battery charger spark suppression circuit comprising, in combination:

first and second output terminals on said battery charger;

a semiconductor switch having first and second main electrodes and a control electrode;

a large filter capacitor;

means connecting said capacitor in series with said main electrodes and connected across said first and second output terminals of said battery charger;

means to delay supplying a voltage from said charger output terminals even though the battery charger may be energized until after said battery charger output terminals are connected to a battery to be charged;

a bias circuit connected to said control electrode and one of said main electrodes and connected to said battery charger output terminals to develop a voltage from the battery to be charged to turn on said semiconductor switch; and

said bias circuit having an impedance across said battery charger output terminals at least one order of magnitude greater than the impedance of said filter capacitor and semiconductor switch thereby to suppress the possibility of a spark upon connection of said charger output terminals to a battery to be charged.

4,682,263

ELECTRICAL SHORT-CICRUIT MONITORING ARRANGEMENT FOR VARIABLE-SPEED, THREE-PHASE MOTORS, INCLUDING THEIR FEED LINES

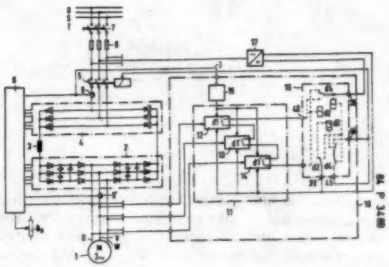
Eckhard Gradnitzer, Zirndorf, Austria, and Herwig Klautschek, Fuerth, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,266

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442827

Int. Cl.[4] H02H *7/08*

U.S. Cl. 361—31 **7 Claims**



1. An electric short-circuit monitoring circuit for a variable speed three-phase motor and the supply lines thereto, said circuit being of the type having a constant-current, d.c.-link converter with a line-commuted system-end thyristor converter, an intermediate reactance circuit, and a self-commuting machine-end converter, said monitoring circuit comprising:

means for monitoring the magnitude level of a ripple voltage superimposed on an output of said d.c.-link converter as a consequence of motor voltage commutation and supplied to each of the three motor phases connected to the output;

means for filtering the ripple voltages to obtain harmonic frequency voltages thereof;

means for comparing the harmonic frequency ripple voltage magnitude level for each of the phases to a preset reference voltage amplitude;

means for generating an interrupt signal in the event that the magnitude of any one of the harmonic frequency ripple voltage levels falls below the preset voltage amplitude reference and

means for interrupting the power supply to the motor in response to the interrupt signal.

4,682,264

CIRCUIT BREAKER WITH DIGITAL SOLID-STATE TRIP UNIT FITTED WITH A CALIBRATION CIRCUIT

Pierre Demeyer, Uriage, France, assignor to Merlin Gerin, France

Filed Feb. 10, 1986, Ser. No. 827,371

Claims priority, application France, Feb. 25, 1985, 85 03158

Int. Cl.[4] H02H *3/093*

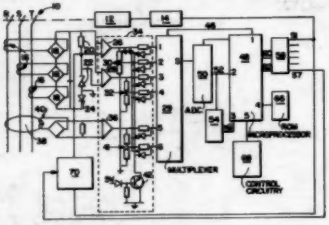
U.S. Cl. 361—96 **6 Claims**

1. A digital solid-state trip unit for an electrical circuit breaker, comprising:

current sensor means for generating analog current signals proportional to respective currents flowing through conductors protected by said breaker;

peak-detector means for rectifying said current signals and for producing a direct analog signal representative of a maximum value of said current signals;

calibration circuit means connected to said peak-detector means for multiplying said direct analog signal by at least four gains to produce at least four calibrated outputs to be connected to at least four inputs of an addressable multiplexer means, said gains related by predetermined ratios, said calibration circuit means comprising at least two amplifiers having a predetermined gain ratio, each amplifier having an input connected to said direct analog signal and an output connected to a respective one of said at least four inputs of said addressable multiplexer means and a respective divider bridge, each divider bridge having a mid-point connected to a respective one of said at least four inputs of said addressable multiplexer means;



said addressable multiplexer means having at least four inputs, connected to said calibrated outputs, for selecting one of said calibrated outputs to provide a multiplexer output signal, said multiplexer output signal being a continuous analog signal representative of said selected calibrated output;

digital-to-analog converter means, connected to said multiplexer means, for converting said multiplexer output signal to a sampled digitized signal;

digital processing means, connected to said analog-to-digital converter means, for providing a circuit breaker tripping order instantaneously or after a short time delay or long time delay when said digitized signal exceeds respective predetermined levels, said multiplexer means being controlled by said processing means to select one of said calibrated outputs compatible with an input range of said analog-to-digital converter means; and

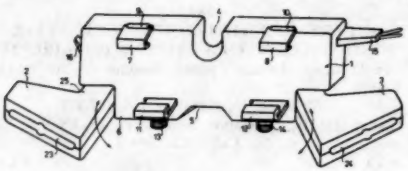
circuit breaker trip means activated by said tripping order.

4,682,265

IONISATOR FOR VEHICLES

László Hiros; Gábor Banati, and Ervin Lipscher, all of Budapest, Hungary, assignors to Medicor Muvek, Budapest, Hungary

Continuation of PCT HU85/00031, filed May 21, 1985, published as WO85/05598, Dec. 19, 1985.
Filed Jun. 14, 1985, Ser. No. 755,181
Claims priority, application Hungary, May 30, 1984, 2108/84
Int. Cl.[4] B60H *3/00*; H01T *23/00*
U.S. Cl. 361—231 **5 Claims**



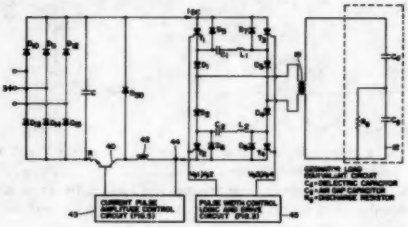
1. A housing for a vehicle ionisator comprising a body fixable within the inner space of the motor vehicle and ionisator armatures coupled thereto said body being a flat longitudinal body (1), on both sides of which an ionisator armature (2, 3) is formed in a mirror-symmetrical fashion, a jointed coupling having an oblique axis with respect to a front plate (6) of the body (1) for coupling each of said armatures to said body in an adjustable fashion, and wherein the body (1) comprises fixing elements.

4,682,266

OZONATOR POWER SUPPLY EMPLOYING A CURRENT SOURCE INVERTER

Anh N. Huynh, Edgewood, Ky., and Pholvos D. Ziogas, Brossard, Canada, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,862
Int. Cl.[4] H01T *23/00*; H02M *7/521*
U.S. Cl. 361—235 **12 Claims**



1. A current source inverter power supply circuit for supplying substantially rectangular current pulses of alternating polarity, alternating in a cycle from a base level to a positive rectangular current pulse, returning to the base level, and then alternating to a negative rectangular current pulse, and then returning to the base level, and then repeating the cycle to generate rectangular current pulses of alternating polarity for an ozonator comprising:

(a) a DC/AC semiconductor switch bridge inverter coupled at its input terminals to a direct current power source and at its output terminals to an electrical load comprising a step up high voltage transformer having its primary winding coupled to said semiconductor bridge inverter and its secondary winding coupled to the ozonator, said semiconductor switch bridge inverter comprising a first semiconductor switch and series connected diode and a fourth semiconductor switch and series connected diode coupled to conduct current in a first direction through the primary winding of said high voltage transformer, and a second semiconductor switch and series connected diode and a third semiconductor switch and series connected diode coupled to conduct current in a second, opposite direction through the primary winding of said high voltage transformer, with each semiconductor switch having a positive electrode, a negative electrode and a gate control electrode;

(b) a forced commutation circuit for commutating off said semiconduc-or switches, including a first series connected commutating capacitor and inductor connected across the negative electrodes of the first and third semiconductor switches, and a second series connected commutating capacitor and inductor connected across the positive electrodes of the second and fourth semiconductor switches, and fifth, sixth, seventh and eighth commutating diodes connected respectively in parallel, with a reversed polarity, across each of said first, second, third and fourth semiconductor switches, such that each commutating capacitor and inductor coupled thereto to turn off the semiconductor switch across which it is connected; and

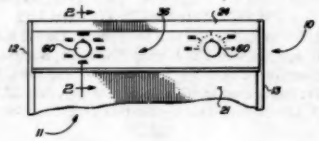
(c) a control circuit for generating gating control signals for said semiconductor switches, said gating control circuit controlling the width of the positive substantially rectangular current pulses conducted through the ozonator load in a first direction by gating said first and fourth semiconductor switches on, and then commutating at least one of said first and fourth semiconductor switches off to return to the base level by controlling the timing of a gating signal applied to at least one of said second and third semiconductor switches, which connects a charged commutating capacitor and inductor across and forward biases a commutating diode of at least one of the first and fourth semiconductor switches, and said gating control circuit controlling the width of negative substantially rectangular current pulses conducted through the ozonator load in a second direction, opposite said first direction, by gating said second and third semiconductor switches on, and then commutating at least one of said second and third semiconductor switches off to return to the base level by controlling the timing of a gating signal applied to at least one of said first and fourth semiconductor switches, which connects a charged commutating capacitor and inductor across and forward biases a commutating diode of at least one of the second and third semiconductor switches.

4,682,267

PANEL ALIGNMENT SYSTEM

Thomas C. Magilton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Aug. 1, 1986, Ser. No. 891,484
Int. Cl.[4] H02B 1/00
U.S. Cl. 361—331 9 Claims



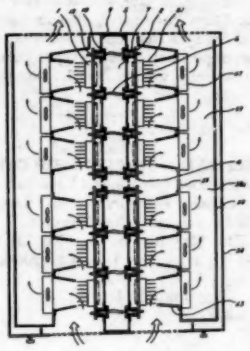
1. A control center including panel alignment apparatus, the combination comprising: means defining a control housing; control support means mounted in said control housing; at least one selector switch attachable to said control support means, said selector switch having a generally forwardly extending actuating shaft; a panel member spaced from said control support means and movable relative thereto, said panel member defining an aperture for receiving said actuating shaft, said panel member further including operating indicia associated with said aperture; alignment means attachable to said control support means and including a projecting portion engageable with said panel member for effecting a connection therebetween; and means for attaching one of said selector switch and said alignment means to said control support means in a relatively fixed position and the other in an adjustable position for limited movement relative to said control support means, said actuating shaft being disposed in said aperture and said alignment means being connected to said panel member with said selector switch and said alignment means in said fixed and adjustable positions whereby said actuating shaft and said operating indicia on said panel member are cooperably disposed, the other of said selector switch and said alignment means being movable from said adjustable position for aligning said operating indicia with said actuating shaft of said selector switch, said means for attaching being operable for locking the other of said selector switch and said alignment means in place when alignment is achieved.

4,682,268

MOUNTING STRUCTURE FOR ELECTRONIC CIRCUIT MODULES

Minoru Okano, and Mitsuo Kohmoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,453
Claims priority, application Japan, Feb. 7, 1985, 60-20883; Feb. 7, 1985, 60-20884; Feb. 19, 1985, 60-21317[U]
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—384 8 Claims



1. A mounting structure with electronic circuit modules comprising:

a plurality of said electronic circuit modules each having a back panel, a plurality of heat-generating electronic components each having a heat sink for heat radiation and mounted on one surface of each of said back panels, and a plurality of first connectors mounted on the other surface of each of said back panels;

a frame having a plurality of first holes and defining a hollow inside structure for mounting said plurality of electronic circuit modules;

a plurality of cable assemblies, each of which has at its both ends second connectors engaged with one of said first connectors through one of said plurality of first holes, and connecting said first connectors within said frame; and

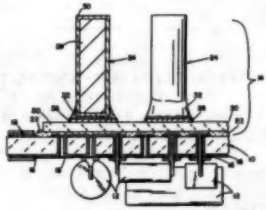
means mounting said plurality of electronic circuit modules onto said frame.

4,682,269

HEAT DISSIPATION FOR ELECTRONIC COMPONENTS ON A CERAMIC SUBSTRATE

Martin J. Pitasi, Newbury, Mass., assignor to Teradyne, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 659,648, Oct. 11, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 908,779
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 7 Claims



1. The combination of a ceramic substrate carrying elec-

tronic components and a heat dissipator for the electronic components, said combination comprising

a ceramic substrate carrying electronic components on one surface and having an opposite surface,

a ceramic plate adjacent to said ceramic substrate and having a first surface adhered in heat conductive relationship to said opposite surface of said substrate by a layer of adhesive, said plate having a second surface, and

a plurality of separate, spaced, free-standing, metallic, cylindrical heat-conducting elements mounted in an array on and extending from said second surface of said ceramic plate, said heat conducting elements being electrically isolated from said electronic components, said elements and exposed portions of said ceramic plate having a combined surface area greater than 1.5 times the surface area of said ceramic plate alone.

4,682,270

INTEGRATED CIRCUIT CHIP CARRIER

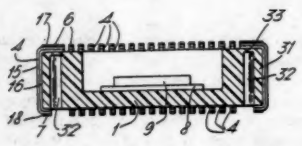
Graham K. Whitehead, Ipswich, and Kenneth Taylor, East Barnet, both of England, assignors to British Telecommunications public limited company, United Kingdom

Filed May 16, 1985, Ser. No. 734,650

Claims priority, application United Kingdom, May 18, 1984, 8412674

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—401 **31 Claims**



1. A leadless chip carrier comprising:

a body having a die attachment site and a body outer wall portion;

first contact pads;

a peripheral sidewall portion radially outward of said body outer wall portion and having a peripheral inner wall portion and a peripheral outer wall portion, said peripheral sidewall portion laterally spaced from said body outer wall portion and having on an underside second contact pads for attaching, in use, the chip carrier to a circuit board, said peripheral sidewall portion having a predetermined height, the second contact pads being electrically connected to the first contact pads;

a link region, disposed near an upper carrier surface remote from said underside, connecting the peripheral sidewall portion to said body, the link region, the peripheral sidewall portion and said body defining a slot disposed generally about a periphery of said body, the link region having a thickness substantially less than said predetermined height and being an elastically deformable region such that, in use, thermally induced strains of the carrier relative to the circuit board are accommodated by the link region.

4,682,271

PRINTED CIRCUIT BOARD AND METHOD FOR FABRICATION THEREOF

Kazuhiko Yamada, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

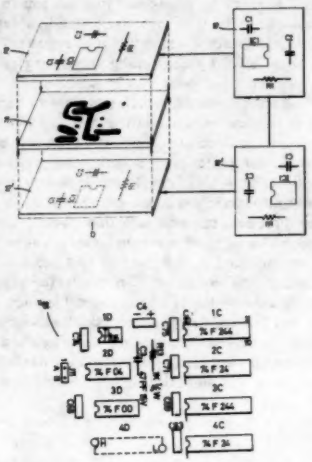
Filed Mar. 27, 1986, Ser. No. 844,609

Claims priority, application Japan, Apr. 8, 1985, 60-72563

Int. Cl.[4] H05K *1/02*

U.S. Cl. 361—409 **7 Claims**

1. A printed circuit board having a circuit pattern formed on at least one of the first and second faces of a substrate and having images which represent components to be mounted on said substrate printed on the first face and the second face of said substrate, wherein the images printed on the first face are reversed images of those printed on the second face, and the



reversed images ~~are located~~ at positions on said first face corresponding to respective positions of the images on the second face.

4,682,272

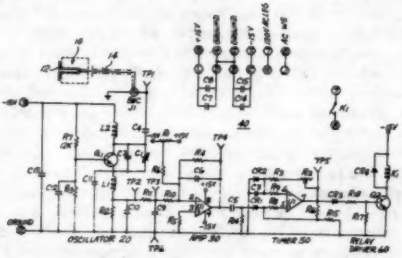
METHOD OF TESTING AND ADJUSTING A PICOFARAD DETECTO CIRCUIT

James J. Furlong, Seattle, and Dwayne E. Howe, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 655,495, Sep. 28, 1984, Pat. No. 4,639,824, and a continuation-in-part of Ser. No. 353,750, Mar. 1, 1982, abandoned. This application Oct. 23, 1986, Ser. No. 922,218

Int. Cl.[4] H01H *47/12*

U.S. Cl. 361—437 **2 Claims**



1. The method of testing and adjusting a picofarad detector circuit comprising the steps of:

measuring the capacitance of a sensor cable;

comparing waveforms to verify oscillator circuit operation;

adjusting sensitivity for maximum voltage shift upon activation of the picofarad detector circuit;

adjusting a threshold voltage to provide a threshold voltage having a predetermined level prior to activation of said picofarad detector circuit; and,

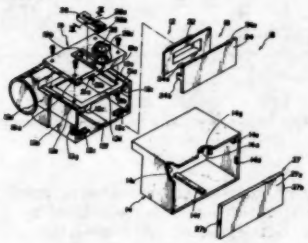
adjusting th ON time period to a predetermined value subsequent to the step of activating by touching a test wire to a sensor plate.

4,682,273

ILLUMINATING ANGLE ADJUSTING APPARATUS FOR AN ELECTRONIC FLASH DEVICE

Toshihiko Taniguchi, and Yukio Miki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 16, 1986, Ser. No. 819,348
Claims priority, application Japan, Jan. 18, 1985, 60-5619[U]
Int. Cl.[4] G03B 15/02
U.S. Cl. 362—18 9 Claims



1. An illuminating angle adjusting apparatus for an electronic flash device, comprising:

a body member including a motor for generating a driving force;

a light emitting portion disposed in said body member and including a light emitter;

a zooming frame carrying an optical lens at its front portion and movable relative to said light emitting portion for adjusting an illuminating angle of said electronic flash device;

a transmission mechanism for moving said zooming frame relative to said light emitting portion, said transmission mechanism including a driving force output means disposed almost at the center of said body member in the lateral direction and a driven means disposed almost at the center of said zooming frame for engaging with said driving force output means thereby being moved by said output means; and

a pair of guide means disposed on the respective side portions of said body member and said zooming frame, each of said guide means including guide portions disposed in said body member and said zooming frame respectively, and said guide means being disposed almost in the same vertical position as said transmission mechanism.

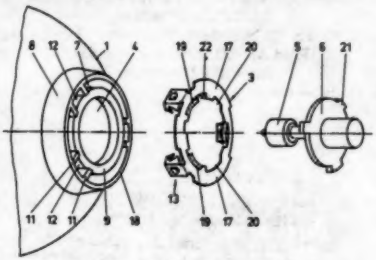
4,682,274

AUTOMOTIVE HEADLIGHT

Erwin Freudenreich; Horst Flerlage, both of Lippstadt, and Karlernst Sewing, Lippstadt-Hörste, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,463
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602234
Int. Cl.[4] H01R 33/46; F21M 3/00
U.S. Cl. 362—61 11 Claims

1. An automotive headlight comprising: a bow-shaped plastic reflector having an apex and an opening at said apex; a sheet metal retaining ring surrounding said opening at the rear of the reflector; an incandescent lamp held by said retaining ring and inserted into said opening at said apex; securing tabs on said retaining ring, said securing tabs being bent back toward said reflector; barbs on said securing tabs for securing said retaining ring to said reflector; opening forming means on said reflector at said apex and surrounding said opening at said apex, said opening forming means forming a plurality of openings having a quadrilateral shape and being substantially as deep and wide as said tabs; said barbs engaging edges of said openings; said



securing tabs being bent into a U-shape; said openings in said reflector receiving said tabs.

4,682,275

MOUNT STRUCTURES FOR SUSPENDER MEMBERS OF PORTABLE FLASHLIGHTS

Keiichi Ohashi, Shizuoka, Japan, assignor to Skylight Industry Co. Ltd., Japan

Filed May 9, 1986, Ser. No. 861,408
Claims priority, application Japan, Nov. 21, 1985, 60-262159
Int. Cl.[4] F21L 15/14
U.S. Cl. 362—191 1 Claim

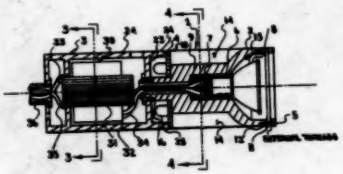
1. A mount structure for a suspender member of a portable flashlight which includes a female member integrally provided on a body of the portable flashlight and a male member detachably fitted over the female member in a sliding manner, said female member having therein a retainer groove into which a first projection of said male member is slidingly fitted from one direction and a stopper member for limiting the movement of said projection, said male member having a second operable projection which can be locked in a locking hole formed in said female member in a state where said first projection is fitted into said retainer groove and restrained by said stopper member of said female member, said second operable projection being resiliently supported in such a manner that it can be engaged within or disengaged out of said locking hole, and being usualy biased for lacking within said locking hole, said male member being fixed relative to the female member with said second operable projection and stopper member in a state where said second operable projection is locked within said locking hole, and said male member having a hook member through which a desired suspender strap is inserted.

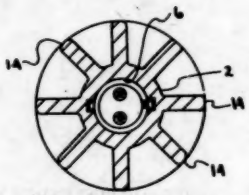
4,682,276

LOW VOLTAGE LIGHTING FIXTURE WITH INTEGRAL THERMALLY CONTROLLED COAXIAL TRANSFORMER

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Apr. 22, 1986, Ser. No. 854,561
Int. Cl.[4] F21V *29/00, 7/00*
U.S. Cl. 362—294 10 Claims





1. A low voltage lighting fixture comprising:

a lamp housing having distal and proximal ends and made of heat conducting material, having an electrically connecting lamp socket on a central axis, a low voltage lamp supported substantially within the distal end of the housing by the lamp socket and a plurality of cooling fins disposed about the exterior of the lamp socket;

a generally planar thermal barrier made of a heat insulating material, disposed at the proximal end of the lamp housing and in thermal contact with a portion of the area of the lamp housing cooling fins;

a tubular transformer housing coaxially disposed at the proximal end of the lamp housing, attached thereto in abuttment with the thermal barrier and in thermal contact with a portion of the area of the thermal barrier; and

a transformer means disposed within the transformer housing, having high voltage input electrical conducting means connectable to a source of external alternating current power and low voltage output electrical conducting means passing through the thermal barrier and connected to the lamp socket of the lamp housing.

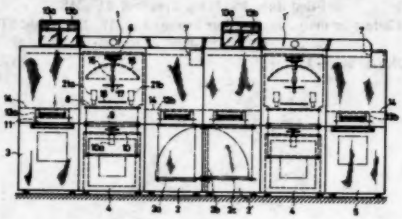
4,682,277

MOVABLE LIGHT SOURCE TYPE EXPOSURE APPARATUS

Yoshio Yazaki, Tokyo, Japan, assignor to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,516
Claims priority, application Japan, May 24, 1986, 61-119899
Int. Cl.[4] F21V *7/00;* G03B *27/54*
U.S. Cl. 362—296 1 Claim

1. An exposure apparatus of movable light-source type, comprising a light source disposed at a position corresponding to a focal point of a substantially parabolic, reflector, a first light-shielding member disposed right beneath said light source and intended to prevent the light rays from said light source from being irradiated directly over an original image and a material to be exposed, a second light-shielding member disposed at a position closer to the position of said original image and material to be exposed so as to cause the formation of a shadow capable of making equal the cumulated amounts of light rays at points thereon, a positioning/fixing means intended, for each exposure, to position and fix a retaining frame for said original and a retaining frame for said material to be exposed, and a light-source moving means for moving a lamp



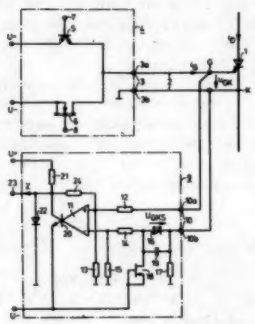
housing having said substantially parabolic reflector, light source, first light-shielding member and second light-shielding member over said original and said material to be exposed for purpose of causing the material to be exposed.

4,682,278

PROCEDURE AND DEVICE FOR DETECTING THE NON-CONDUCTING STATE OF TURN-OFF THYRISTORS

Rainer Marquardt; Theodor Salzmann, both of Erlangen, and Michael Peppel, Koenigstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,471
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434607
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—58 58 Claims



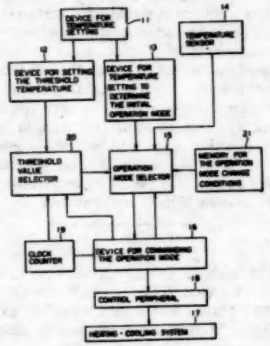
1. A device for operating a turn-off thyristor comprising: a threshold voltage comparator circuit having: a first input connected to a gate terminal of the turn-off thyristor at a second input terminal; a negative threshold voltage value reference element connected within the threshold voltage comparator circuit in series with the second input terminal; a status signal output for issuing a status signal when the voltage between the first input and the second input terminal is less than the negative threshold voltage; and a differential amplifier connected within the threshold voltage comparator as a zero voltage comparator having its output connected to the status signal output having a first input connected to the threshold voltage comparator circuit first input, and a second input connected in series with a reference voltage element to the threshold voltage comparator circuit second input in order to generate the negative threshold voltage value.

4,682,279

OPERATION MODE CONTROLLER

Shin Watabe, Nishihiwajima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 616,244, Jun. 1, 1984, abandoned. This application Dec. 1, 1986, Ser. No. 937,451
Claims priority, application Japan, Jun. 7, 1983, 58-101438
Int. Cl.[4] G05B 11/01; F25B 29/00
U.S. Cl. 364—141 8 Claims


DEVICE FOR TEMPERATURE SETTING
TEMPERATURE SENSOR
DEVICE FOR SETTING THE THRESHOLD TEMPERATURE
DEVICE FOR TEMPERATURE SETTING TO DETERMINE THE INITIAL OPERATION MODE
THRESHOLD VALUE SELECTOR
OPERATION MODE SELECTOR
MEMORY FOR THE OPERATION MODE CHANGE CONDITIONS
CLOCK COUNTER
DEVICE FOR COMMANDING THE OPERATION MODE
CONTROL PERIPHERAL
HEATING · COOLING SYSTEM

1. An operation mode controller for controlling a system having at least three operation modes comprising:

sensing means for determining a current value of a specific variable;

means for presetting a desired value of said specific variable;

means for presetting a plurality of sets of threshold values of said specific variable, each said set of threshold values associated with one of the operation modes and each set may contain an upper value limit and a lower limit value;

selecting means for choosing a first one of said plurality of sets of threshold values to provide change condition information,

memory means for storing change condition information in the controller,

operation mode selector means for comparing the current value of the specific variable and threshold values of said first one of said plurality of sets of threshold values chosen by said selecting means; wherein a new one of said operation modes is selected only when the current value of the specific variable exceeds said upper value limit or falls below said lower value limit of said first one of said plurality of sets of threshold values, said new operation mode being selected in accordance with said change condition information in said memory means;

means for producing a command for an operation mode in response to the operation of said operation mode selector means, a first operation mode being changed to said new operation mode when said new one of said operation modes is selected by said operation mode selector means, the first operation mode being unchanged when said operation mode selector does not select said new one of said operation modes, said command being sent to a control peripheral of the system and to said selecting means;

counter means for sending a signal to said selecting means at a predetermined time t after the means for producing a command produces a command for the operation mode;

said selecting means further selecting a set of threshold values from said means for presetting a plurality of sets of threshold values that corresponds to the operation mode that corresponds to said command after receiving said signal from said counter means; and

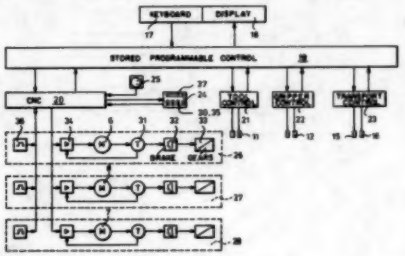
means for setting an initial operation mode wherein said current value of said specific variable is compared to a preset initial value.

4,682,280

SIMULATION ARRANGEMENT FOR DETERMINING DESIRED VALUES FOR THE TRANSPORT OF WORKPIECES OF A MULTISTAGE PRESS

Franz Schneider; Helmut Braitinger, and Otto Feinauer, all of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

PCT No. PCT/DE84/00277, § 371 Date Aug. 22, 1985, § 102(e) Date Aug. 22, 1985, PCT Pub. No. WO85/02921, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 19, 1984, Ser. No. 768,478
Claims priority, application European Pat. Off., Dec. 24, 1983, 83113091.9
Int. Cl.[4] G05B 19/42; G06F 15/46
U.S. Cl. 364—191 8 Claims



1. A multi-stage press simulation arrangement for determining desired values for the transport of a workpiece and related gripper movement and tool automation by using less than all the elements of a multi-stage press comprising:

transport means separate from said multi-stage press for physically replicating the movement of at least one transport means of said multi-stage press, the transport means including movable transfer rails carrying gripping devices and moving along guide means and at least one driving means for driving said transfer rails through braking means and movement changing means;

a means for tool automation, a means for gripper control and a means for control of a workpiece transport connected to said transport means; and

a program control means for controlling the movement of said transport means through said driving means and generating a program to be used on said multi-stage press for the sequence of movement of said transport means with respect to said tool automation means, gripper control means and said transport control means.

4,682,281

DATA STORAGE UNIT EMPLOYING TRANSLATION LOOKASIDE BUFFER POINTER

Gary A. Woffinden, Scotts Valley, and Donald L. Hanson, Los Altos Hills, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Aug. 30, 1983, Ser. No. 528,094
Int. Cl.[4] G06F 12/08, 12/10
U.S. Cl. 364—200 9 Claims

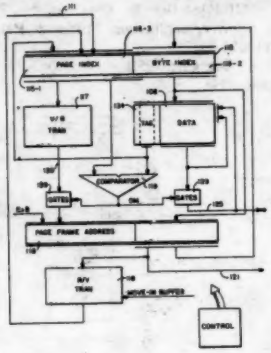
1. A memory apparatus for a data processing system that generates logical addresses identifying requested data stored at locations in a mainstore addressed by system addresses; the apparatus comprising:

register means, adapted for communication with the data processing system, for storing a requesting logical address, the logical address including a first field and a second field;

translation lookaside buffer means, in communication with the register means, for storing translations to system addresses at translation lookaside buffer locations addressed by the first field of the requesting logical address;

cache means, in communication with the register means and the mainstore, for storing data at cache location addressed by the second field of the requesting logical address, the cache location storing a version of data stored at a location in mainstore having a system address and storing a pointer pointing to a translation lookaside buffer location;

means, in communication with the register means and the translation lookaside buffer means, for matching the requesting logical address with the translation at the translation lookaside buffer location addressed by the first field



of requesting logical address to identify a valid translation to a system address;

means, in communication with the register means and the cache means, for matching the pointer at the cache location addressed by the second field of the requesting logical address with the translation lookaside buffer location; and

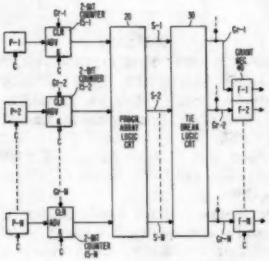
means, responsive to identification of a valid translation from the first matching means and a match of the pointer from the second matching means, for selecting the data out of the cache means.

4,682,282

MINIMUM LATENCY TIE-BREAKING ARBITRATION LOGIC CIRCUITRY

Michael W. Beasley, Owens Cross Roads, Ala., assignor to Unisys Corp., Detroit, Mich.

Filed Oct. 25, 1984, Ser. No. 664,468
Int. Cl.[4] G06F *3/00, 13/00*
U.S. Cl. 364—200 **13 Claims**



1. Arbitration means for selecting which one of a plurality of requestors is to be granted access to a commonly shared means, said arbitration means comprising:

a counting means for each requestor for providing binary count output signals indicative of how long its corresponding requestor has been waiting for access;

means for periodically advancing each counting means in response to an access request from its respective requestor from an initial count until its respective requestor is granted access, the advancement of each counter occurring independently of access requests from other requestors;

combinational logic means to which said binary count output signals from said counters are applied for producing a binary selection signal corresponding to each requestor, said combinational logic means being operative in response to the applied binary count output signals for activating a selection signal of a corresponding selector when no other of said requestors has been waiting longer for access; and

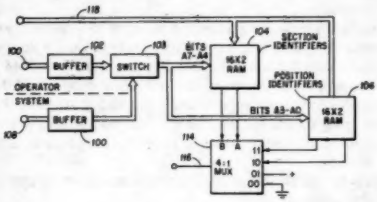
tie-breaking logic means to which the selection signals from said combinational logic means are applied for producing a grant signal corresponding to each requestor, said tie-breaking logic means being operative in response to the applied selection signals to activate none of the grant signals when none of the applied selection signals are activated and to activate only one grant signal when one or more selction signals are activated.

4,682,283

ADDRESS RANGE COMPARISON SYSTEM USING MULTIPLEXER FOR DETECTION OF RANGE IDENTIFIER BITS STORED IN DEDICATED RAM'S

James R. Robb, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1986, Ser. No. 827,495
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **1 Claim**



1. A system for comparing the position of a digital address with respect to a range of digital addresses comprising:

means for storing data within a memory space defined by a predetermined number of digital addresses wherein each address is defined by a unique combination of a predetermined number of digital bits;

means for dividing said memory space into a plurality of sections wherein each section contains a plurality of said addresses and each section is defined by one portion of said predetermined number of bits and wherein the position of each address within a section is defined by another portion of said predetermined number of bits;

first means responsive to said one portion of said predetermined number of bits for establishing a section identifier for each section to define the position of said section with respect to a predetermined range of digital addresses having upper and lower end point addresses within said memory space, wherein said first means for establishing section identifiers comprises an N-by-2 RAM wherein N equals the number of sections and each identifier is represented by a 2-bit digital pattern defining each section;

second means responsive to said portion of said perdetermined number of bits for establishing position identifiers for each address within a section containing an end point address of said range, wherein said second means for establishing position identifiers comprises an M-by-2 bit RAM wherein M equals the number of addresses within each end point section and one of the bits of the M-by-2

RAM contains a digit forming the position identifier defining the position of each address within an end point section relative to the lower end point of said range, and the other of said bits of the M-by-2 RAM contains a digit forming the position identifier defining the position of each address within an end point section relative to the upper end point of said range;

means for selecting a data input having an address defined by section and position identifiers; and

means for detecting the identifiers defining said selected address to determine the position of the selected address relative to said range, wherein said means for detecting comprises a multiplexer constructed to have inputs which receive the 2-bit identifiers from each of said first and second means in response to a selected address for providing an output representing the position of said address relative to said range, said multiplexer being constructed to provided a first output in response to said section identifiers when a selected address falls outside of said range, provide a second output in response to a section identifier when a selected address falls within said range, provide a third output in response to a position identifier when a selected address falls within a section containing a lower end point of said range, and provide a fourth output in response to a position identifier when a selected address falls within a section containing an upper end point of said range.

4,682,284

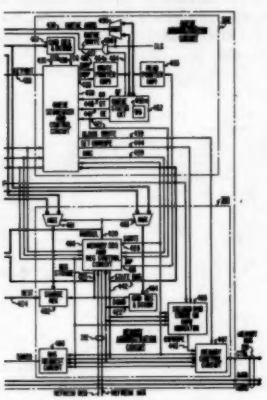
QUEUE ADMINISTRATION METHOD AND APPARATUS

Eldred P. Schrofer, Batavia, Ill., assignor to American Telephone & Telegraph Co., AT&T Bell Lab., Murray Hill, N.J.

Filed Dec. 6, 1984, Ser. No. 678,898

Int. Cl.[4] G06F *12/00*; G11C *29/00*

U.S. Cl. 364—200 **33 Claims**



1. An arrangement comprising:

storage means organized as a queue having a head end and a tail end, the storage means including a plurality of storage locations for holding queue entries;

means for storing a queue entry received for processing, in a free at least one location at the tail end of the queue;

means for determining whether the stored tail end entry is invalid;

means responsive to the determining means for freeing the at least one location holding an invalid tail end entry to hold a new tail entry;

means for retrieving a stored queue entry for processing from the head end of the queue;

means for determining whether the queue is empty; and

means, coupled to the retrieving means and cooperative with the means for determining whether the queue is empty, for obtaining a retrieved entry from the retrieving means when the queue is determined not to be empty, and for receiving an entry for processing directly, by bypassing the queue, when the queue is determined to be empty.

4,682,285

UNIVERSAL COUPLING MEANS

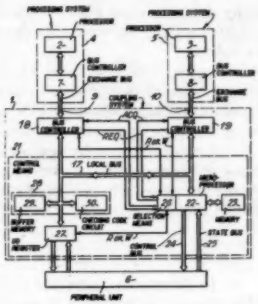
Maurice Ozil, 73, rue des Morillons, Paris, and Alain Falgueires, 44, rue Victor Hugo, Puteaux, both of France

Continuation of Ser. No. 517,447, Jul. 26, 1983, abandoned. This application Aug. 29, 1986, Ser. No. 902,110

Claims priority, application France, Aug. 6, 1982, 82 13765

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **3 Claims**



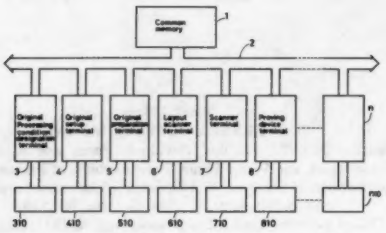
1. A universal coupling means for linking information and data processing systems and at least one peripheral unit, each processing system comprising at least one processor and an exchange bus for exchanging information and data with the peripheral unit under the management of said coupling means which is connected to the exchange buses of the processing systems and to the peripheral unit, said coupling means comprising bus controllers connected respectively to the exchange buses and to local buses, control means connected to the local buses and to the peripheral units;

the bus controllers managing the information exchanges on the exchange buses and on the local buses, as well as any request made by a processor requiring an access to the peripheral unit through the corresponding local bus, the control means comprising a microprocessor for managing priorities of the access requests made by the processors and for processing control information provided by data processing systems and information provided by the peripheral unit in relating to the state of this unit, the information being exchanged on the local bus, selection means connected to the bus controllers and controlled by the microprocessor of the control means for selecting, as a function of the priorities, the controller ensuring a data exchange on a local bus, and an input and output buffer register connected to the local buses and to the peripheral unit for receiving the data to be transmitted to the peripheral unit from one of the processors or for receiving the data to be transmitted to one of the processors from the peripheral unit.

4,682,286
SYSTEM FOR SUPERVISING PHOTOMECHANICAL PROCESS

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 21, 1984, Ser. No. 674,329
Claims priority, application Japan, Dec. 30, 1983, 58-247933
Int. Cl.[4] G06F *13/12, 13/16*
U.S. Cl. 364—200 9 Claims



1. A method for supervising a photomechanical process comprising the steps of:

(a) inputting data via a bus into a common memory unequipped with a CPU by means of a terminal attached to operate a device;

(b) transmitting data when necessary via the bus from the memory by means of the terminal to carry out a stage of the photomechanical process by the device;

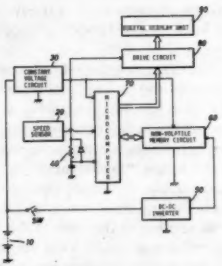
(c) renewing the data to operate the device stored in the memory when operation of the device completes; and

(d) rewriting as necessary the data stored in the memory to operate the device only by means of the terminal corresponding to the device.

4,682,287
ELECTRONIC ODOMETER

Tooru Mizuno, Nagoya; Keizi Oosugi, Kariya; Motoharu Esaki, Oobu, and Takao Ogawa, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1984, Ser. No. 645,154
Claims priority, application Japan, Aug. 30, 1983, 58-158387
Int. Cl.[4] G06F *15/20;* G01C *22/02*
U.S. Cl. 364—561 4 Claims



2. An electronic odometer adapted for use in a wheeled vehicle, comprising:

speed detecting means for producing a series of speed signals, respectively indicative of a speed of the vehicle;

main non-volatile memory means, having first to mn-th storage means each of which can respectively store therein a first binary digit indicative of a predetermined unit travel distance of the vehicle only one of said storage areas changing its stored binary digit value in response to the increment if said predetermined unit travel distance;

auxiliary non-volatile memory means for incrementally storing therein a plurality of second binary digits, each indicative of mn times said predetermined unit travel distance

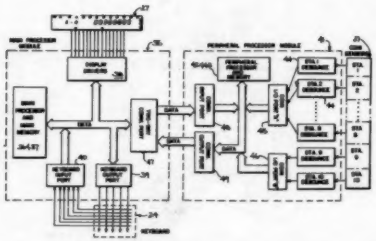
data processing means including : (a) first means for repetitively determining said predetermined unit travel distance in response to said speed signals, (b) second means responsive to each determination of said predetermined unit travel distance for sequentially searching said storage areas of said main non-volatile memory means to determine whether said first binary digit is respectively stored in all the storage areas of said main non-volatile memory means, and for applying said first binary digit to only one of the non-stored storage areas of said main non-volatile memory means if said first binary digit is not stored in all of said storage areas, and for applying said second binary digit to said auxiliary non-volatile memory means and erasing all of said first binary digits stored in the storage areas of said main non-volatile memory means if said first binary digit is stored in all of said storage areas, and (c) third means for determining a total mileage of the vehicle based on the first and second binary digits respectively stored in said main and auxiliary non-volatile memory means and for producing an output signal indicative thereof; and

display means responsive to the output signal from said third means of said data processing means for indicating the total mileage of the vehicle.

4,682,288
ELECTRONIC CONTROL FOR TOTALING DENOMINATIONS OF SEVERAL COUNTRIES

Dale L. Taipale, Delafield, and John G. Brome, Waukesha, both of Wis., assignors to Brandt, Inc., Watertown, Wis.

Continuation of Ser. No. 899,761, Aug. 21, 1986, abandoned, which is a continuation of Ser. No. 596,439, Apr. 3, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 935,625
Int. Cl.[4] G07G *7/48, 1/12;* G07D *9/00;* G06M *9/00*
U.S. Cl. 364—406 12 Claims



1. An electronic device for totaling and displaying monetary values by denomination from a batch of coins in one of a plurality of national monetary systems, the electronic device being connectable to a coin sorter of a type having a plurality of coin slots for receiving a plurality of denominations in the batch of coins and of a type having signal generating means reponsive to coins passing into the coin slots for generating signals indicative of the number of coins in a respective denomination passing into each of the respective slots, wherein the electronic device comprises:

user-operable input means operable at some times for entering individual values for respective denominations of a selected national monetary system, said user-operable input means also being operable at other times for entering commands to display accumulated monetary values for the respective denominations in the batch of coins;

arithmetic means connectable to detect the signals from the signal generating means, said arithmetic means being

responsive to such signals and to the individual values entered through the user-operable input means for calculating accumulated monetary values for the respective denominations in the batch of coins based on the individual values entered through the user-operable input means;

display means for displaying accumulated monetary values for the respective denominations in the batch of coins; and

communication means coupled to the user-operable input means for receiving the individual values of the respective denominations, said communication means also being coupled for transmitting the individual values to the arithmetic means and being coupled for receiving the accumulated monetary values from the arithmetic means, said communication means being responsive to one of the commands entered through the user-operable input means for selecting an accumulated monetary value for one of the respective denominations in the batch of coins for display on the display means.

4,682,289

VIEW INTERPOLATION IN A TOMOGRAPHY SYSTEM USING PIPE LINE PROCESSING

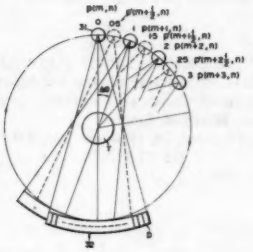
Eitaro Nishihara, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

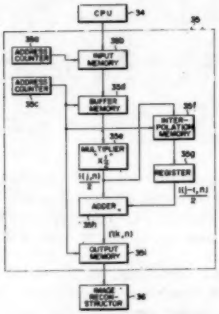
Continuation of Ser. No. 455,999, Jan. 6, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 821,211

Claims priority, application Japan, Jan. 6, 1982, 57-380

Int. Cl.[4] G06F *15/42*; A61B *6/03*

U.S. Cl. 364—414 **13 Claims**





1. A computerized tomography apparatus for reconstructing a cross-sectional image of an object comprising

source means for directing fan-shaped beams of radiation to pass through the object;

detector means having a plurality of elements for detecting the radiation through the object along a plurality of paths of said fan-shaped beams and for providing measured projection data representative of radiation intensity integrated along each of said paths;

scanning means for rotating at least said source about the object to cause said fan-shaped beams to assume successive different angularly spaced viewpoints m relative to the object

estimating means for generating estimated projection data for imaginary viewpoints between said viewpoints m, said estimating means including;

transfer means for transferring a train of said projection data obtained from said detector means at said viewpoints m, said train periodically including two successive identical projection data therein, and

adding means for successively adding the last two projection data transferred from said transfer means to generate a stream of said measured projection data with said estimated projection data interspersed at positions among said measured projection data corresponding to positions of said imaginary viewpoints among said viewpoints m; and

image reconstruction means for performing convolutions and back projections of the estimated projection data provided from said estimating means to reconstruct the cross-sectional image of the object.

10. A computerized tomography apparatus for reconstructing a cross sectional image of an object comprising:

source means for directing fan shaped beams of radiation to pass through the object;

detector means having a plurality of elements for detecting the radiation through the object along a plurality of paths of said fan shaped beams and for providing corresponding output signals representative of radiation intensity integrated along each of said paths;

scanning means for effecting relative rotation between said source means and said detector means and for obtaining projection data from said output signals at different viewpoints with respect to said object;

transfer means receiving the projection data from said scanning means and transferring projection data indicated by a maximum integer which does not exceed $C \times N$ at transfer sequence N, where C is a constant larger than 0 and less than 1, and N is a successive integer;

generating means comprising a memory device for storing the projection data transferred from said transfer means at transfer sequence $N-1$, multiplying means for multiplying the projection data transferred from said transfer means at transfer sequence $N-1$ and the projection data transferred from said transfer means at transfer sequence N by respective weighting values, and adding means for adding the projection data transferred from said transfer means at transfer sequence $N-1$ and N and multiplied by said respective weighting values to provide estimated data at $C \times (N-1)$ viewpoint; and

image reconstruction means for forming a reconstructed image of the object from said estimated projection data to reconstruct the cross sectional image of the object.

4,682,290

METHOD OF RECONSTRUCTING A HIGH RESOLUTION IMAGE BY TOMODENSITOMETRY

Siv C. Tan, Paris; Didier Le Galle, Jouy en Josas, and Claude Benchimol, Paris, all of France, assignors to Thomson - CGR, Paris, France

Filed Mar. 26, 1985, Ser. No. 716,354

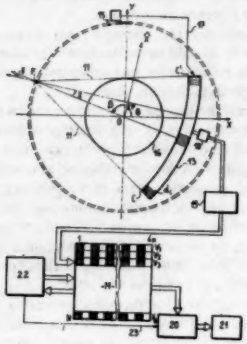
Claims priority, application France, Mar. 30, 1984, 84 05042

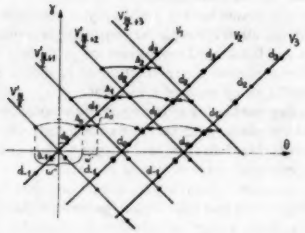
Int. Cl.[4] G06F *15/42, 15/52*

U.S. Cl. 364—414 **2 Claims**

1. A method of reconstructing images by tomodensitometry, of the type having a source-detectors assembly, the method comprising rotating a source-detectors assembly in the plane of a section whose image it is desired to form, said source emitting a penetrating radiation beam in the form of a fan and taking and storing a succession of views for different rotational angles β of the source-detectors assembly with respect to a fixed reference axis system (XOY) of said plane, a plurality of detectors being arranged so as to converge towards the focal point (F) of

said source and each view being sampled for angles γ representative of the detectors and referenced from a straight line (OF) joining a center of rotation (0) of the source-detectors assembly and said focal point (F), an angular shift between two adjacent





detectors $\Delta\gamma$ being constant and an angular shift between views being constant, with the angular shift between said straight line (OF) and the nearest detector thereto adjusted to

$$\left|\frac{\Delta\gamma}{4}\right|$$

and

taking and storing a series of views spaced apart over a complete revolution of said source-detectors assembly,

measuring for each view a number of intermediate values representing sampling interlaced with that of said detectors, each intermediate value of a given angle γ being obtained by a combination of at least two linear absorption values inferred from measured values taken from the views situated on each side of a fictitious view whose image by a transformation $T(\theta,\gamma)=(\theta+(2k-1)\pi,-\gamma)$ contains a point representative of said intermediate value in a space $[\theta,\gamma]$ with $\theta=\beta+\gamma$ and k a relative integer, said measured values of said views being taken from an angle detector opposite one of said desired intermediate value, and

applying a reconstruction algorithm, comprising a convolution and a rear projection to the views thus completed by said intermediate values.

4,682,291

NOISE ARTIFACTS REDUCTION

Asher Reuveni, Natanya, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Oct. 26, 1984, Ser. No. 665,047

Int. Cl.[4] G06F *15/42*; G01T *1/29*; G01N *23/04*

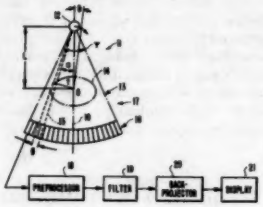
U.S. Cl. 364—414 **18 Claims**

1. A method for rearranging divergent beam derived data to obtain tomographic images with uniform noise distribution, the method including the steps of:

directing divergent beams of penetrating radiation through a body being examined from source means on one side of said body,

angularly displacing the divergent beams relative to the body,

detecting radiation that has passed through the body at a number of angularly spaced positions to derive sets of detected radiation data representative of a plurality of angularly spaced shadowgrams indicative of the absorption of the radiation by different portions of the body,



reordering the sets of detected radiation data from sets of data corresponding to divergent projections to sets of data corresponding to parallel projections,

said reordering step including the step of interpolating using uniform noise distribution interpolation,

rebinning at least a portion of the sets of data corresponding to said parallel projections to form another set of parallel projections, and

using the rebinned data in the formation of a displayed image.

4,682,292

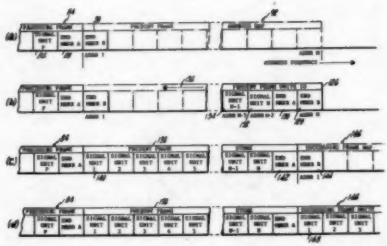
FAULT TOLERANT FLIGHT DATA RECORDER

Richard L. Bue, West Hartford, and Ratchford Michael, East Granby, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1984, Ser. No. 633,730

Int. Cl.[4] G11B *5/02*

U.S. Cl. 364—424 **5 Claims**



1. The method of storing serial bit data signal units in electronic memory, comprising the steps of:

arranging the data signal units in successive frames, serially, from a data signal unit to a last data signal unit in each frame;

adding first and second pointer signal units following said last data signal unit in each frame, said first pointer and second pointer signal units and said data signal units each having a plurality of signal bits; and

storing the frames at successive memory address locations in electronic memory, by first storing said second pointer signal unit of a present frame to a first address location furthest from a preceding stored frame, and proceeding serially backwards with the data signal units until said first data signal unit of the present frame is stored at the address location of said second pointer signal unit of said preceding stored frame to replace said second pointer signal unit of said preceding stored frame, whereby said present frame is stored with said first and second pointer

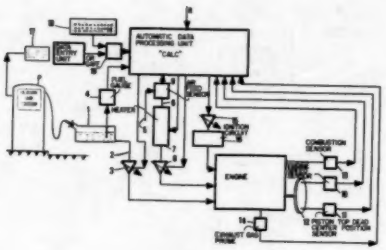
signal units and said preceding stored frames are stored with said first pointer signal unit.

4,682,293

AUTOMATIC REGULATING PROCESS AND DEVICE FOR MULTIFUEL INTERNAL COMBUSTION ENGINES

Emanuel Goldenberg, Poissy, and André Douaud, Puteaux, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 28, 1982, Ser. No. 437,241
Claims priority, application France, Oct. 28, 1981, 81 20372
Int. Cl.[4] F02M *43/00*; G06D *11/02*; G06F *15/20*
U.S. Cl. 364—431.05 7 Claims



1. Apparatus for automatically regulating the running conditions of an internal combustion engine connected to a fuel tank, the apparatus comprising:

means for connecting the fuel tank to the engine, the connecting means including only a single fuel line extending between the fuel tank and the engine, the single fuel line having a valve therein, the valve having valve control means associated therewith for controlling flow of fuel through the fuel line;

an automatic data processing unit, the automatic data processing unit including a memory and a plurality of inputs, the inputs being connected to the following outputs:

a fuel level output from a fuel level monitor in the fuel tank;

an output of a fresh fuel data selector such as a card or keyboard which passes data relating to fresh fueling of the tank, the data including the amount of and appropriate stoichiometric air-fuel ratio of the fresh fuel which has filled the tank, the output of the data selector being connected to the memory for storage with data relating to previous fresh fuelings and with the fuel level output so as to provide a current air-fuel ratio for fuel existing in the fuel tank;

outputs from the engine of combustion air feed rate and combustion air temperature sensors;

an output from the engine of an exhaust gas monitor;

an output from the engine of an ignition timer; and

an output of a techometer associated with the engine;

the automatic data processing unit including the following output lines;

a control signal line connected to a heater for operating the heater to select the temperature of the combustion air;

a control signal line connected to a combustion air valve for operating the combustion air valve to select the rate at which combustion air flows to the engine:

a control signal line connected to an ignition circuit for controlling the timing of the ignition cicuit of the engine; and

a control signal line connected to a valve control means for controlling the valve in the single fuel line to select the rate at which the fuel is delivered to the engine;

whereby:

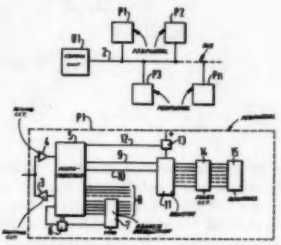
the outputs of the automatic data processor are a function of the inputs to the data processor including the input of the fresh fuel data corresponding to the amount and type of fuel currently in the tank, and the amount and type of fuel which previously filled the tank.

4,682,294

ELECTRIC ENERGY DISTRIBUTING DEVICES COMPRISING MICROPROCESSORS

Michel Duc, Savigny S/Orge; Philippe Montreuil, Torcy, and Jean-Jacques Meuleman, Orsay, all of France, assignors to Automobiles Citroen, Neuilly-sur-Seine and Automobiles Peugeot, Paris, both of, France

Filed Oct. 17, 1984, Ser. No. 661,669
Claims priority, application France, Oct. 18, 1983, 83 16843
Int. Cl.[4] G06F *11/20*
U.S. Cl. 364—492 2 Claims



1. A device for distributing electrical energy, particularly in vehicles, from a current source to a multiplicity of peripherals electrically connected to said source, said device comprising:

a central control unit provided with means for transmitting, receiving, storing and processing coded information for controlling the startup and shutdown of current controllers of said peripherals;

a coded information bus connected to said central control unit; and

a peripheral circuit for each of said peripherals, each of said peripheral circuits including microprogrammed means programmed with subprograms for each of said peripherals and identical to those of the other microprogrammed means of the other peripheral circuits at respective addresses so that each of the microprogrammed means have identical sets of said subprograms for each of said peripherals, and with an address recognition circuit responsive to coded information received from said bus for identifying the coded information for each particular peripheral circuit and then addressing a specific one of said subprograms to be carried out at the particular peripheral circuit for controlling the operation of a respective current controller.

4,682,295

ANTI-SKID BRAKE CONTROL SYSTEM WITH OPERATIONAL MODE CONTROL AND METHOD THEREFOR

Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 17, 1984, Ser. No. 601,363
Claims priority, application Japan, May 16, 1983, 58-84088
Int. Cl.[4] B60T *8/34*
U.S. Cl. 364—426 22 Claims

1. An anti-skid brake control system for an automotive hydraulic brake system comprising:

a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel;

a pressure control valve disposed within said hydraulic circuit and operative to increase fluid pressure in said wheel cylinder in a first position thereof, to decrease the fluid pressure in said wheel cylinder in a second position

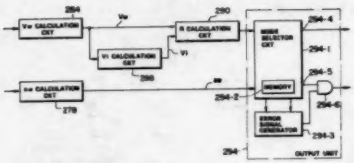
thereof and to hold the fluid pressure in said wheel cylinder constant in a third position thereof;

a wheel speed sensor means for detecting the rotational speed of said vehicle wheel and producing sensor signal pulses separated by intervals, said intervals representative of detected wheel speed;

a first means for detecting wheel acceleration and producing a first signal indicative of the detected wheel acceleration;

a second means for detecting the slip rate of the vehicle wheel with respect to the ground and producing a second signal indicative of the detected slip rate;

a third means for producing a control signal which actuates said pressure control valve in a predetermined sequence of



positions of said first, second and third positions so as to adjust the wheel rotational speed toward an optimal relationship with vehicle speed, said third means generating said control signal based on a predetermined relationship between values of said first and second signals; and

a fourth means, associated with said third means and responsive to said control signal for determining an intended sequence of operations of said pressure control valve in said first, second and third positions and for modifying said control signal when said control signal would otherwise control said pressure control valve to operate outside said predetermined sequence of positions to assure that said pressure control valve always operates in said predetermined sequence of positions.

4,682,296

ULTRASONIC IMAGING

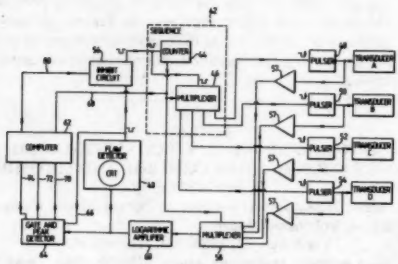
John A. Parker, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 1, 1984, Ser. No. 656,339

Claims priority, application United Kingdom, Oct. 14, 1983, 8327639

Int. Cl.⁴ G01N *29/04, 24/04;* **G06F** *15/40;* **G06B** *42/06*

U.S. Cl. 364—518 **5 Claims**



1. An ultrasonic data collection system comprising means for generating pulses with a constant repetition rate, means for sequentially routing the pulses to a plurality of ultrasonic transducers so as to initiate triggering of the transducers in a predetermined sequence, a computer which, in response to a transducer echo signal, executes a data collection routine which may span a time interval exceeding the time interval between successive pulses, means for routing the echo signals received by the transducers to the computer for recordation, and means for inhibiting, under the control of the computer, transmission of pulses to the transducers for at least part of the time during which the computer executes a data collection routine in response to a previous non-inhibited pulse.

4,682,297

DIGITAL RASTER SCAN DISPLAY SYSTEM

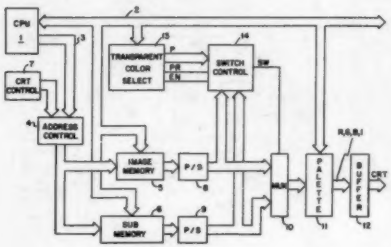
Tomoyuki Iwami, Yamato, Japan, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 26, 1985, Ser. No. 716,008

Claims priority, application Japan, Apr. 13, 1984, 59-73127

Int. Cl.⁴ G09G *1/00;* **G06F** *3/153*

U.S. Cl. 364—521 **9 Claims**



1. A raster scan display system comprising:

first and second memory means for storing display data;

access means for simultaneously reading data from the first and second memories to provide respective streams of picture element data groups for display on a raster scan display device;

switch control means coupled to the memories to receive said streams of data and to a data processing device to receive therefrom a data group representing a selected picture element value and having an output carrying signals indicative of equality or inequality between each picture element group in a selected one of said streams and said selected picture element value data; and

first multiplexer means coupled to receive said streams and having a control input responsive to said output to select one or the other picture element group in each pair of corresponding groups in the respective streams in accordance with the corresponding indicative signal for passage through the multiplexer towards the raster scan display device.

4,682,298

SYSTEM FOR DERIVING A MEASURING SIGNAL IN A HEATING SYSTEM

Wolfram K. Andre, Aichwald, Fed. Rep. of Germany, assignor to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,093

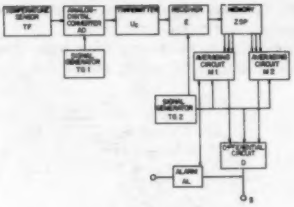
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338788

Int. Cl.⁴ H05B *1/02;* **A47J** *27/62*

U.S. Cl. 364—557 **15 Claims**

1. A process for deriving a measuring signal dependent on the temperature rise of a temperature-time characteristic curve in a heating system comprising a cooker with cooking materials on a heating plate wherein the temperature of said cooker is measured by means of a temperature sensor and an analogous measuring signal is emitted by said temperature sensor (TF), said process comprising: periodically converting said analogous measuring signal into corresponding digital signals; cyclically feeding said digital signals into a plurality of memory points of a cyclically-functioning memory (ZSP) with "n" memory points wherein the cyclical feeding of one of said digital signals through all "n" of said "n" memory points de-

fines a cycle; deriving a first and a second temperature average from said digital signals after each said cycle of "n" memory points using a first k and a last k memory points of said memory (ZSP), where said first temperature average is derived from said first K memory points and said second temperature average is derived from said last K memory points, where k is less



than n/2 and k is greater than one, and deriving a difference between said first and second temperature averages; deriving said measuring signal (s) after completion of each said cycle from said difference between said first and second temperature averages; and after completion of each said cycle, clearing all said memory points of said memory (ZSP) and repeating said cycle.

4,682,299

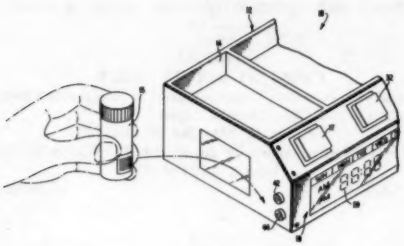
MEDICATION CLOCK

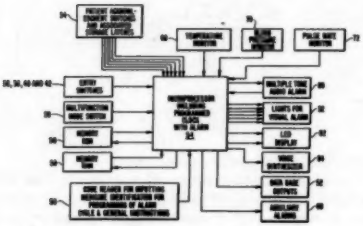
Kenneth B. McIntosh, c/o W. B. McIntosh, Sr., Rte. 4, Box 119, Greensburg, Ind. 47240; James O. Pratt, Murfreesboro, Tenn., and Donald E. Stout, Annandale, Va., assignors to Kenneth B. McIntosh, Rockvale, Tenn.

Filed Feb. 19, 1985, Ser. No. 702,746

Int. Cl.[4] G08B *1/00*; G06G *15/20*

U.S. Cl. 364—569 **16 Claims**





1. A medication clock comprising:

(a) a plurality of compartments with each compartment being separately usable for holding one or more medications to be taken by a patient, the medications being chosen from prescription medications which have individual dosages to be taken at specific times, prescription medications to be taken under the control of the patient on an as needed basis and nonprescription medications to be taken under the control of the patient;

(b) a programmable timing means which produces a medication dispensing signal indicating the time that a patient is to take one or more medications to be taken at specific times;

(c) means responsive to the medication dispensing signal produced by the programmable timing means to produce an alarm for alerting the patient that it is time to take a particular medication, said means for alerting including a tone generator and a separate visual display indicator located in proximity to each of said compartments, said tone generator producing an audible tone in response to the medication dispensing signal and said visual display indicator in proximity to the compartment associated with the medication to be taken producing a visual indication in response to the medication dispensing signal;

(d) means located in proximity to each of said compartments which are separately activable by a patient for producing a patient acknowledgment signal that any one of the medications stored in one of the compartments has been taken including medications taken by the patient in response to an alarm and medications taken without an alarm;

(e) a memory coupled to the programmable timing means and to the means for producing each patient acknowledgment signal and having a plurality of separate storage locations with each storage location being associated with one of the means for producing a patient acknowledgment signal and its associated compartment, each separate storage location being used for storing the time and date of each patient acknowledgment signal produced by the associated means for producing a patient acknowledgment signal as an identification of the medication taken from the associated compartment and the time and date of taking the medication from the associated compartment; and

(f) means coupled to the memory for providing an output of the identification of the medication, and time and date of each dosage of medication taken by the patient which is stored in the separate locations of the memory for each of the medications being taken by the patient including those medications taken under the control of the programmable timing means in response to an alarm as well as medications taken by the patient without an alarm.

4,682,300

IMAGE CORRECTION PROCESSING METHOD AND APPARATUS

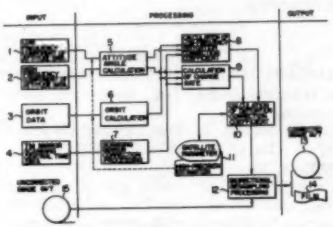
Youichi Seto, Hadano; Koichi Homma, Sagamihara; Fuminobu Komura, Yokohama; Shimbu Yamagata, Kawasaki; Yutaka Kubo, Hitachi, and Hirotaka Mizuno, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,742

Claims priority, application Japan, Jan. 20, 1983, 58-7530

Int. Cl.[4] G01C *25/00*; G03B *27/68*; H04N *7/18*; G06K *9/40*

U.S. Cl. 364—571 **9 Claims**



1. A correction processing method for processing a digital image signal representing a satellite image including geometric

distortion caused by low and high frequency attitude fluctuation and scanning velocity fluctuation comprising the steps of:

determining a first set of distortion correction coefficients for a low-frequency component of geometric distortion based on a low-frequency component of attitude data in said image signal;

determining a first deviation quantity on the satellite image corresponding to the attitude fluctuation based on a high-frequency component of attitude fluctuation data and scanning velocity fluctuation data in said image signal;

determining a second set of distortion correction coefficients covering a high frequency component of the geometric distortion by adding signals representing said determined first deviation quantity to a second deviation quantity which corresponds to said first set of distortion correction coefficients; and

correcting the digital image signal representing said satellite image based on said determined second set of distortion correction coefficients.

4,682,301

DIGITAL FILTER FOR PROCESSING TWO-DIMENSIONAL DIGITAL IMAGE

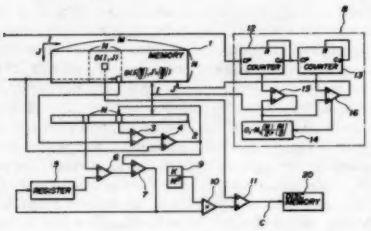
Isao Horiba, Kariya, and Ken Ishikawa, Matsudo, both of Japan, assignors to Hitachi Medical Corp., Japan

Continuation of Ser. No. 528,248, Aug. 31, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 871,246

Claims priority, application Japan, Sep. 2, 1982, 57-151804

Int. Cl.[4] G06F *15/31*; H01J *40/14*

U.S. Cl. 364—724 **21 Claims**



1. A digital filter for subjecting each of M×M picture elements to a filtration process where a parameter of each picture element is modified at least in accordance with the sum of the values of said parameter for each of N×N picture elements surrounding said picture element, said filter comprising:

a buffer storage means for storing at least a portion of said M×M picture elements; and

processing means responsive to at least one of the picture elements stored in said buffer storage means for effecting said filtration process including first subprocessing means responsive to said one picture element for obtaining said sum of the values of said parameter for each of the N×N picture elements in a time period which is independent of the value of N.

4,682,302

LOGARITHMIC ARITHMETIC LOGIC UNIT

Tim A. Williams, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1984, Ser. No. 681,453

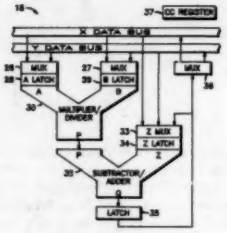
Int. Cl.[4] G06F *7/556*; G05F *7/50*

U.S. Cl. 364—768 **11 Claims**

1. In a digital signal processing system, a logarithmic arithmetic logic unit for receiving first and second operands and implementing predetermined alogrithms, comprsing:

first calculating means for selectively receiving the frist and second operands, each operand being in a logarithmic number representation, and for either multiplying or dividing said operands by effecting an addition or subtraction, respectively, of said first and second operands to provide an intermediate resultant operand at an output, said first calcualting means having a zero value operand detector for detecting when either the first or second operand has a quantized zero logarithmic value and having zero force means for outputting a quantized zero value without effecting said addition or subtraction, thereby minimizing quantization error; and

second calculating means having a first input coupled to the output of the first calcualting means for receiving said



intermediate resultant operand, and a second input for selectively receiving a third operand in a logarithmic number representation, said second calculating means selectively effecting a subtraction or addition of the intermediate resultant operand with the third operand to provide a final resultant operand in an logarithmic number representation, said second calculating means having bypass means for selectively directly outputting a predetermined one of the intermediate resultant operand or the third operand without effecting an addition or subtraction, said selective coupling being effected without use of a bypass path external to the second calculating means.

4,682,303

PARALLEL BINARY ADDER

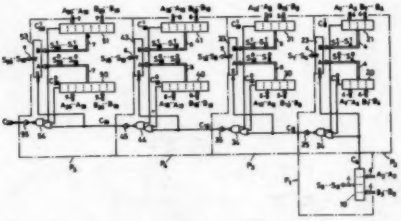
Masaru Uya, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 23, 1984, Ser. No. 643,385

Claims priority, application Japan, Sep. 5, 1983, 58-163503

Int. Cl.[4] G05F *7/50*

U.S. Cl. 364—788 **4 Claims**



1. A parallel binary adder comprising:

first order block-adder means for adding a first blocked addend to a first blocked augend with a carry input of 0,

a row of block-adder means having a second order block-adder means and subsequent order block-adder means for adding respective blocked addends to respective blocked augends in respective block-adder means,

each block-adder means comprising:

first adder means for adding a blocked addend to a blocked augend under a first premise that carry input data is 0,

second adder means for adding said blocked addend to said

blocked augend under a second premise that carry input data is 1,

block-carry signal generator means for generating a block-carry signal based on a carry output signal from said first adder means and a carry output signal from said second adder means and a block-carry signal from an adjacent lower order block, and

data selector means for selectively issuing one output signal from either said first adder means or said second adder means as a block-sum output signal, responding to said block-carry signal from an adjacent lower order block-adder means,

a number of bits of said first adder means and said second adder means in a block-adder means being larger than a number of bits of said first adder means and said second adder means in an adjacent lower order block-order, thereby substantially synchronizing incoming times of said carry output signals from said first adder means and said second adder means with said block-carry signal from said adjacent lower order block-adder means.

4,682,304

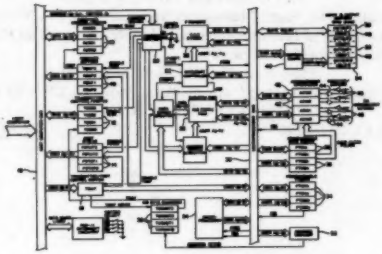
ASYNCHRONOUS MULTIPLE BUFFERED COMMUNICATIONS INTERFACE HAVING AN INDEPENDENT MICROPROCESSOR FOR CONTROLLING HOST/PERIPHERAL EXCHANGES

Lannie J. Tierney, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 520,395, Aug. 4, 1983, abandoned. This application May 23, 1986, Ser. No. 867,640

Int. Cl.[4] G06F *3/00, 13/00*

U.S. Cl. 364—900 **13 Claims**



1. A communication interface for controlling data transmission between a host computer and at least one external device, the data consisting of one or more characters, said communications interface comprising:

(a) control means comprising a microprocessor;

(b) data storage means and bus means coupling said control means in addressing relation to said data storage means so that said data storage means is addressed by said microprocessor of said control means;

(c) said interface further includidng means for

(i) coupling data from the host computer to an output buffer maintained within said data storage means, said output buffer having a plurality of sequentially addressable data storage character locations in said data storage means which are addressed by said microprocessor without data transfer from said microprocessor such that a data character received from the host computer is stored in the next sequentially available data storage location of said output buffer without reading of said data by said microprocessor; and

(ii) data transfer from said output buffer to an external output device independently of the operation of the host computer; and

(d) address storage means for storing a pointer to the next sequentially available data storage location of said output buffer, said address storage means being accessed by said microprocessor for obtaining said pointer for addressing said next sequentially available data storage location of said output buffer.

4,682,305

STORAGE SYSTEM

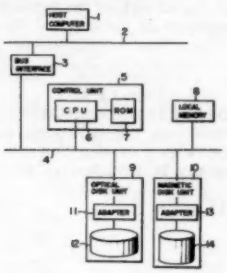
Tatsuo Ishikawa, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1984, Ser. No. 654,955

Claims priority, application Japan, Sep. 30, 1983, 58-182284

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—900 **18 Claims**



1. A storage system which comprises:

a bus line;

a first storage unit incapable of rewriting connected to said bus line;

a second storage unit capable of rewriting connected to said bus line, said second storage unit having a control table for registering one or more addresses of said first storage unit in which data are desired to be rewritten and one or more addresses of said second storage unit in which said rewrite data are temporarily stored; and

a control unit connected to said bus line for controlling said second storage unit in accordance with said control table such that said data desired to be rewritten into said addresses of said first storage unit are temporarily stored in the corresponding addresses of said second storage unit.

4,682,306

SELF-REFRESH CONTROL CIRCUIT FOR DYNAMIC SEMICONDUCTOR MEMORY DEVICE

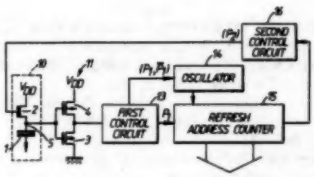
Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1985, Ser. No. 767,602

Claims priority, application Japan, Aug. 20, 1984, 59-172754

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—222 **6 Claims**



1. A self-refresh control circuit for a dynamic semiconductor memory device having a plurality of memory cells, comprising:

leak current monitor means consisting of a capacitor having voltage leakage characteristics similar to those of the memory cells of said memory device to determine the status of the charge of said memory cells;

means connected to said capacitor for charging said capacitor to a predetermined voltage;

an inverter circuit connected at its input to said capacitor for detecting the voltage of said capacitor and providing a refresh signal when said voltage is less than a predetermined minimum level;

refresh timing control means connected to the output of said inverter circuit for controlling a refresh operation for said memory cells in response to said refresh signal; and

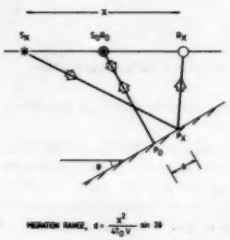
pulse generating means for detecting when said refresh operation has been completed and then generating a signal to said charging means to cause said charging means to charge said leak current monitor means.

4,682,307

UNDERWATER SEISMIC TESTING

Paul Newman, Westerham, United Kingdom, assignor to Horizon Exploration Limited, Swanley, United Kingdom

Filed Aug. 21, 1984, Ser. No. 642,840
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—21 **3 Claims**



1. A method of underwater seismic investigating, which comprises:

(a) determining seismic velocity distribution data in the region of interest;

(b) traversing the region of interest with a survey vessel towing a single seismic source-receiver pair with a fixed separation between said source and said receiver;

(c) firing said single seismic source repeatedly at predetermined intervals;

(d) recording the sub-sea response to the repeated firings of said seismic source using said single seismic receiver to produce thereby single-trace data; and

(e) subjecting said single-trace data and said seismic velocity distribution data in the region of interest to signal processing comprising a first deconvolution stage and a second 3-D imaging stage to generate thereby detailed sub-sea geological data.

4,682,308

ROD-TYPE MULTIPOLE SOURCE FOR ACOUSTIC WELL LOGGING

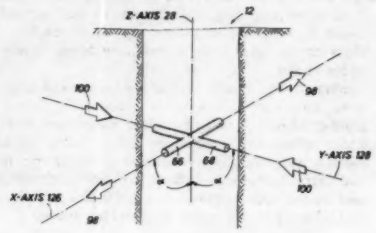
Jing-Yau Chung, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 4, 1984, Ser. No. 607,340
Int. Cl.[4] G01V *1/00*; H04R *17/00*
U.S. Cl. 367—31 **27 Claims**

1. Apparatus for introducing 2^N pole acoustic waves into a subsurface earth formation traversed by a borehole having a longitudinal axis, where N is an integer not less than two, including:

a housing having a central longitudinal axis and defining at least one window, said housing being adapted to be disposed in the borehole so that the central longitudinal axis of the housing is substantially parallel to the longitudinal axis of the borehole; and

a number of rods disposed within said housing, each rod having a longitudinal axis extending through one of said windows, and each rod being composed of material selected so that the rod changes in length along its longitudinal axis in response to electrical excitation so as to generate acoustic waves within said housing in a manner such that the acoustic waves will propagate toward the formation and be incident at the interface between the borehole and the formation in the direction of the longitudinal axis of the rod, and will thereafter interfere in the formation to produce a 2^N-pole acoustic wave in the formation.

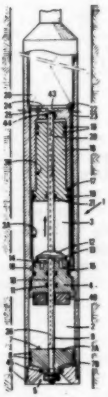


4,682,309

DEVICE FOR GENERATING ACOUSTIC PULSES BY IMPLOSION, INSIDE A WELL

Pascal Dedole, Rueil Malmaison, and Jean Laurent, Morainvilliers, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 28, 1984, Ser. No. 675,854
Claims priority, application France, Nov. 29, 1983, 83 19185
Int. Cl.[4] G01V *1/38, 1/14*
U.S. Cl. 367—146 **7 Claims**



1. A device for generating acoustic pulses by implosion inside a well comprising an elongate rigid body having a section less than that of the well and connected by a cable to a surface installation, said rigid body comprising a first and second coaxial chamber isolated from each other by a fixed separation element, said first chamber having an opening at one end thereof communicatable with a medium external of the rigid body, a first piston adapted for tightly sliding inside said first chamber between a first position and a second position,

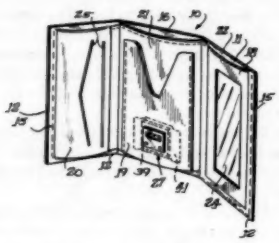
said piston having a face exposed to pressure outside said rigid body and being secured to a valve adapted form moving in the second chamber and coming into engagement against a seat formed on the separation element, in the first position of said first piston, a second piston adapted for tightly sliding inside the rigid body on a side of the valve opposite said first piston and having a stroke at least equal to that of the first piston between its first and second positions, means for establishing, on one side of the first piston, a pressure very much lower than the external pressure, and a hydraulic control system comprising drive means and hydraulic circuits, disposed inside said rigid body for moving said first piston to its first position, through the second piston pushing the valve onto its seat and for intermittently maintaining the valve against its seat, when the second piston is brought back to the end of the second chamber opposite said separation element, wherein said hydraulic control system comprises means for providing a fluid at a first pressure equal to a hydrostatic pressure prevailing outside the rigid body and pump means for intermittently delivering fluid at a second upper pressure for returning the first piston to the first position, wherein said opening of said first chamber has a section less than that of said first chamber, said first piston comprising a part whose section is adapted to that of said opening and which closes said opening in the first position of said first piston, and the section of the valve is greater than that of said part of said first piston, and wherein said valve is secured to the first piston by a rod passing through said separation element and said second chamber comprises two parts of unequal sections, said second piston comprises two parts of different sections adapted respectively to the sections of the two parts of said second chamber, a largest section end of said second piston being adapted to come into abutment against the valve.

4,682,310

ARTICLE WITH ELECTRIC TIMEPIECE

Eric W. Lund, and Raymond W. Young, both of West Bend, Wis., assignors to Amity Leather Products Company, West Bend, Wis.

Filed May 14, 1985, Ser. No. 734,336
Int. Cl.[4] G04B *37/00*; A44C *5/00*
U.S. Cl. 368—278 **6 Claims**



1. A pocket-sized leather product having a timepiece integrally associated therewith comprising, in combination,

a battery-powered watch mounted on an integral oversized, planar flange and having a cover member, the planar flange having a marginal edge portion extending beyond the edges of the cover member and comprising a printed circuit board of operating the battery-powered watch;

a multi-layer leather product having a cutout in its outer layer sized to receive the cover member of the watch in substantially flush relationship to the outer layer; and

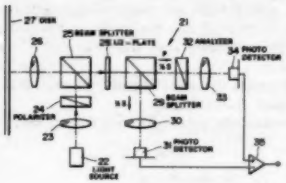
means for securing the watch to the leather product by means of the oversized flange.

4,682,311

PHOTOMAGNETIC DIFFERENTIAL REPRODUCING SYSTEM

Nobuhide Matsubayashi, and Kiichi Kato, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,559
Claims priority, application Japan, Jan. 31, 1985, 60-16912
Int. Cl.[4] G11B *11/00*
U.S. Cl. 369—13 **3 Claims**



1. A photomagnetic differential reproducing system, comprising:

(a) light projecting means for condensing and projecting a linearly polarized beam upon a recording medium having a recording layer formed of a ferromagnetic substance, the projected polarized beam being reflected from the medium with a deflection angle in either direction according to a magnetization direction of the medium;

(b) halfwave plate means for rotating a polarization direction of the reflected and deflected polarized beam, by an angle;

(c) beam splitter means for splitting the reflected beam passed through said halfwave plate into a transmitted light and a reflected light while functioning as an analyzer for one of the transmitted light and reflected light, said splitter means being formed with a reflection factor of zero or 100% for s- or p-polarized light, the polarization directions of both the lights being perpendicular to each other;

(d) analyzer means having a predetermined orientation angle for analyzing the other of the transmitted light and the reflected light;

(e) two photodetector means for receiving the light reflected from or transmitted through said beam splitter without passing through said analyzer means and the light reflected from or transmitted through said beam splitter passing through said analyzer means and transducing the received lights into two electric signals corresponding thereto, respectively; and

(f) differential amplifier means responsive to the two transduced electric signals for outputting a differential output signal between the two.

4,682,312

DISC PLAYER WITH SEARCH NOISE SUPPRESSION

Tsuneo Furuya, Tokyo, and Yoshizumi Inazawa, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 497,404, May 23, 1983, Pat. No. 4,592,036.
This application Mar. 6, 1986, Ser. No. 837,028
Claims priority, application Japan, May 23, 1982, 57-87157; May 25, 1982, 57-88445
Int. Cl.[4] G11B *20/10*, *20/24*
U.S. Cl. 369—32 **7 Claims**

1. A reproducing apparatus for reproducing program information from a substantially planar disc containing a plurality of blocks of digital program information data, each block including address data, the apparatus comprising:

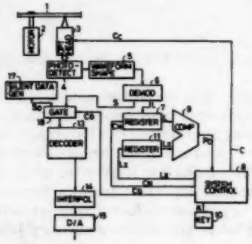
an optical head for reading said digital program information data and address data on said disc, said disc being moveable relative to said optical head, and for providing an output comprising reproduced digital program information data and address data, said optical head being selectively operable in a searching mode for locating predetermined address data associated with predetermined pro-

gram information and a playback mode for providing program information data for conversion into said predetermined program information;

processing circuit means for converting obtained information data into a program information output, said processing circuit means cooperating with said optical head to obtain therefrom said reproduced program information data for conversion into said program information output, said processing circuit means including decoding circuitry for accepting said program information data in said output of said optical head and performing a decoding operation thereon to provide decoded program information data at a predetermined delay time from the start of said decoding operation;

detecting means for detecting said address data in said output of said optical head;

system controlling means for controlling said optical head



when operating in said searching mode and for establishing said playback mode of said optical head in response to the detection of said predetermined address data by said detecting means; and

noise-suppressing means including a silent-data generating means for cooperating with said processing circuit means to suppress the conversion into program information output of reprduced program information data while said optical head is in said searching mode, said silent-data generating means providing a silent-data signal corresponding to program information data substantially without program information to said processing circuit means in lieu of said reproduced program information data while said optical head is in said searching mode, said processing means converting said silent-data signal into silent program information, whereby noise generated by the conversion of reproduced program information data is suppressed while the optical head is in the search mode.

4,682,313

DISK STORING SYSTEM FOR DISK PLAYER

Kazunari Miyake, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jun. 3, 1985, Ser. No. 740,718

Claims priority, application Japan, Sep. 18, 1984, 59-197619; Sep. 18, 1984, 59-197620

Int. Cl.[4] G11B *23/04*

U.S. Cl. 369—39 **4 Claims**

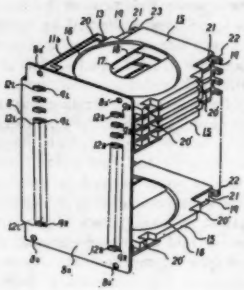
1. A disk storage system for a disk player comprising

a cabinet containing a reproducing unit,

a plurality of shelves vertically arranged within said cabinet,

disk holders, each containing a recess for holding a disk therein, and an opening in the bottom thereof for the reproducing unit to be inserted therein, said disk holders being disposed in said plurality of shelves,

a disk extracting mechanism operatively associated with said disk holders for transferring said disk holders containing said disk to said reproducing unit; said recess in said disk holder having peripheral walls which are inclined to support the periphery of the disk, and said disk holder being provided with a rib disposed around the opening in the bottom thereof for supporting the disk at the radial,



center, non-recording portion of the disk, whereby the recording portion of the disk does not come into contact with the bottom of the disk holder.

4,682,314

DISC PLAYBACK APPARATUS

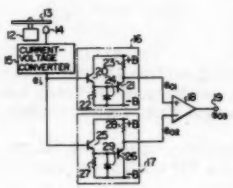
Harushige Nakagaki; Yoshimi Iso, both of Yokohama, and Shigeki Inoue, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,782

Claims priority, application Japan, Aug. 30, 1982, 57-149311

Int. Cl.[4] G11B *21/10*

U.S. Cl. 369—44 **6 Claims**



1. An apparatus for use in an optical disc player, for detecting flaws on a disc, said disc player including an optical pickup for receiving a reflected light from a light spot on the disc and for deriving a recording information signal, comprising:

parallel connected first and second electric circuits for receiving said recording information signal and for producing respective outputs; and

a comparator for receiving said respective outputs and for detecting a dent in said recording information signal to thereby detect a flaw on said disc, said dent being caused by said flaw;

said first electric circuit including first level detecting means for detecting a maximum value level of said recording information signal, said first level detecting means including a first resistor and a first capacitor having values set so that a discharge time constant of said first resistor and first capacitor is large as compared with a time interval corresponding to a width of the flaw, to enable the detection of said maximum value level without disturbance from said flaw;

said second electric circuit including second level detecting means for detecting a change of the maximum value level of said recording information signal, said second level detecting means including a second resistor and a second capacitor having values set so that a discharge time constant of said second resistor and second capacitor is small

enough to follow the change of the dent in the level of said recording information signal;

said comparator comparing the output of said first level detecting means with the output of said second level detecting means to detect the flaw and for providing an output indicative thereof.

4,682,315

FOCUSSING ERROR DETECTION DEVICE FOR USE IN OPTICAL DISK TYPE RECORDING SYSTEM

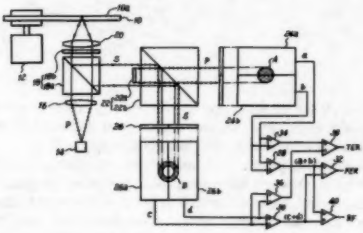
Atsushi Uejima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 14, 1985, Ser. No. 744,921

Claims priority, application Japan, Jun. 22, 1984, 59-127323

Int. Cl.[4] G11B 7/09

U.S. Cl. 369—45 **8 Claims**



1. A focussing error detection device for use in an optical disk type recording system wherein a light beam is converged by objective lens means onto a recording surface of a disk and wherein the light beam reflected by said recording surface is divided by a first beam divided interposed between said objective lens means and a light beam source, said detection device comprising a focussing error detection device which comprises a second beam divider for further dividing the light beam divided by said first beam divider into a central light beam fraction and a peripheral light beam fraction, a first photo detector for detecting the quantity of the central light beam fraction, a second photo detector for detecting the quantity of the peripheral light beam fraction, and a subtracter for indicating the difference between the output from the first photo detector and the second photo detector.

4,682,316

OPTICAL INFORMATION PROCESSING APPARATUS FOR LIGHT BEAM FOCUS DETECTION AND CONTROL

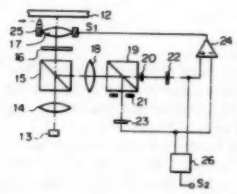
Masamichi Tateoka, Yokohama, and Hideaki Yano, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,342

Claims priority, application Japan, May 29, 1984, 59-110206

Int. Cl.[4] H04N 7/00

U.S. Cl. 369—46 **7 Claims**



1. An optical information processing apparatus comprising:

record/reproduction means for irradiating a focused light beam onto a track on a record medium to record or reproduce information;

tracking control means for precisely directing the irradiated light beam to the track;

split means for splitting at least a portion of a reflected or transmitted light beam of the irradiated light beam from the record medium into two light beams;

first screen means for screening a center area of a first of the split light beams across a width of said track so as to transmit a peripheral area of the first split light beam;

second screen means for screening a peripheral area of the second of the split light beams across the width of said track so as to transmit a center area of the second split light beam; and

detection means for comparing light intensities of the two light beams transmitted without being screened by said first and second screen means to detect a focusing state of the irradiated light beam with respect to said record medium.

4,682,317

SUBCODE SIGNAL READING CIRCUIT IN AN OPTICAL TYPE DISC PLAYER

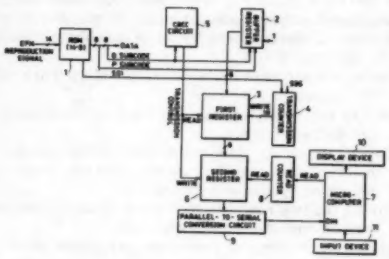
Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 11, 1984, Ser. No. 660,435

Claims priority, application Japan, Oct. 14, 1983, 58-190912

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—59 **5 Claims**



1. A subcode signal reading circuit in an optical type digital audio compact disc reproduction device for processing P subcode and Q subcode data read from a compact disc by the reproduction device comprising:

an eight to fourteen modulation (EFM) demodulation circuit for receiving an EFM reproduction signal reproduced from the optical type compact disc, EFM-demodulating the EFM reproduction signal and outputting a demodulated data signal in eight-bit increments;

a first register in which one of the Q subcode signal included in the demodulated eight-bit signal provided by said EFM demodulation circuit is written in 8-bit divided fashion;

a second register to which contents of said first register are transmitted; and

an error detection circuit for detecting whether or not the Q subcode produced by said EFM demodulation circuit contains error,

transmission of the contents of said first register to said second register being controlled by an output of said error detection circuit, the transmission being made when no error has been detected by said error detection circuit, and

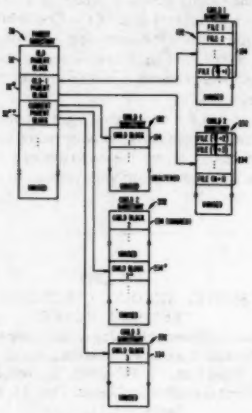
an output of said second register being used in said optical type disc reproduction device as a correct Q subcode to be read.

4,682,318

METHOD AND APPARATUS FOR UPDATING OPTICAL MEMORY DISC

Bruce E. Busby, Sunnyvale, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,013
Int. Cl.[4] G11B 5/76, 5/09
U.S. Cl. 369—59 13 Claims



1. A method of updating a memory disc, the disc being of the type that has a plurality of zones, one of the zones containing at least one directory block that includes a plurality of entries in the form of addresses which point at data, the method comprising the steps of

reading the entries of the one directory block into a temporary location;

altering the entries of the one directory block with new directory information;

dividing the entries of the one directory block into two new directory blocks, each of the new directory blocks being designated by a separate pointer;

writing the two new directory blocks from the temporary location onto the memory disc; and

storing the pointers into a new directory pointer block of the memory disc, whereby

subsequent addition of new directory information requires the alteration of less than all of the directory blocks.

4,682,319

PIVOTING FRONT COVER FOR A DRAWER

Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,915
Claims priority, application Netherlands, Oct. 12, 1984, 8403117
Int. Cl.[4] G11B 17/04; A47B 81/06
U.S. Cl. 369—75.2 20 Claims

1. An apparatus having a front closure for space above an extendable drawer, to provide ready access to a top surface of the drawer, comprising

a housing having a front opening and a side wall,

a drawer, rectilinearly slidable in outward and inward directions with respect to said housing, through said opening,

a front cover for covering a portion of the opening above the drawer, pivotable relative to said housing between open and closed positions, and

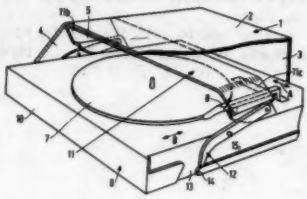
control means on the drawer for controlling pivotal movement of the cover during sliding movement of the drawer,

characterized in that said apparatus comprises a control element connected to said housing side wall,

said drawer has a guide edge extending generally in the directions of slidable rectilinear movement of said drawer,

said control means comprise an actuating projection and a reset projection on said drawer, each disposed adjacent said housing side wall,

said front cover comprises a front portion, and at least one side portion extending rearwardly from the front portion and articulated to said control element, said side portion having at least two bearing edges arranged such that in



said closed position one of said bearing edges bears on said guide edge, and in said open position another of said bearing edges bears on said guide edge, and

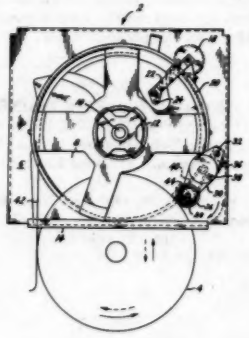
said element, projections and edges are arranged such that during outward movement said actuating projection engages said control element to pivot said cover to the open position, and during inward movement said reset projection engages said control element to pivot said cover to the closed position.

4,682,320

POWER-OPERATED DEVICE FOR ASSISTING LOADING AND UNLOADING A DISC PLAYER

Stéphane A. M. d'Alayer de Costemore d'Arc, Genappe, Belgium, assignor to Staar S. A., Belgium

Filed Aug. 23, 1985, Ser. No. 768,562
Claims priority, application Belgium, Mar. 14, 1985, 0/214648
Int. Cl.[4] G11B 25/04
U.S. Cl. 369—77.1 7 Claims



1. A power-driven device for assisting the loading and unloading operations of a slot-type disc player apparatus, said apparatus being mounted in a housing having an entrance slot for discs, said device comprising:

guide means in said housing engageable by the edge of the disc during rolling movement of the disc along a substantially linear path through the entrance into and out of the housing;

power-operated roller means mounted in said housing on a movable support and carried by said support to be engage-

able with the edge of the disc generally diametrically opposite the edge engaging said guide means, said roller means having an aggressive surface engageable with both the inward and outward edges of the disc; and

bidirectional drive means including a motor connected to drive said roller means in both directions to positively rotate the disc by engagement first with the inward edge thereof and subsequently with the outward edge thereof to cause rolling movement thereof along said guide means to load the disc into the apparatus in one direction of rotation and, first with the outward edge thereof and subsequently with the inward edge thereof to cause rolling movement thereof along said guide means, to unload the disc out of the apparatus in the other direction of rotation.

4,682,321

OPTICAL RECORDING MEDIUM

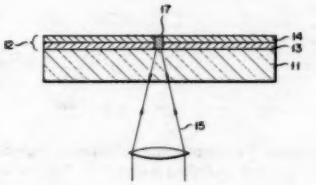
Takashi Takaoka, Yokohama; Satoru Koyahara, Tokyo, and Tetsuo Saito, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1985, Ser. No. 694,664

Claims priority, application Japan, Jan. 28, 1984, 59-14058

Int. Cl.⁴ G01D *15/34;* **G11B** *7/24*

U.S. Cl. 369—284 **9 Claims**



1. An optical recording medium for recording information, comprising a substrate and a recording layer comprising two thin semiconductor films disposed on said substrate, said two thin semiconductor films consisting of a combination of thin films made of two materials selected from the group consisting of germanium, tellurium, bismuth, antimony and alloys thereof, wherein said thin semiconductor films can be at least partially converted into a single layer when irradiated with a laser beam and information can be recorded by said partial conversion.

4,682,322

DISK CARTRIDGE

Teruo Ohta, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

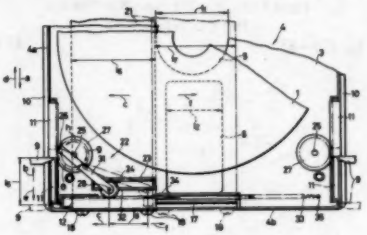
Filed May 20, 1986, Ser. No. 865,002

Claims priority, application Japan, May 20, 1985, 60-074915[U]

Int. Cl.⁴ G11B *25/04, 7/00*

U.S. Cl. 369—291 **6 Claims**

1. In a disk cartridge, wherein a disk used as a recording medium is accommodated in a cartridge comprising an upper half and a lower half, a first rack and a second rack are so provided as to be slidingly movable along respective sides of the cartridge, which are perpendicular to each other, a transmission mechanism provided within the cartridge links the first rack with the second rack, a shutter is secured to the second rack, and at least recording head or reproducing head insertion openings of the cartridge are opened and closed by the shutter as the second rack is moved through the transmission mechanism by the first rack operated by an external force, the improvement in which said transmission mechanism comprises a third rack fixed in said cartridge in parallel with and opposite to said second rack, a second pinion meshed with both said second rack and said third rack and movable along said fixed third rack, a first pinion meshed with said first rack, rotatably mounted in said cartridge and having a eccentric pin, and a rod



connecting said eccentric pin with the shaft of said second pinion.

4,682,323

INTERCONNECTING INTEGRATED CIRCUITS

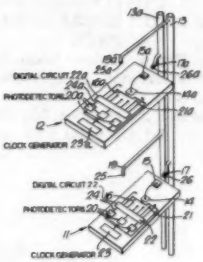
Kenneth G. Corfield, Hampstead, and John S. Heeks, Harlow, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Apr. 12, 1985, Ser. No. 723,491

Claims priority, application United Kingdom, Apr. 14, 1984, 8409751

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—4 **9 Claims**



1. An integrated circuit device including a digital integrated circuit having a plurality of electrical signal outputs and inputs,

switch means whereby said outputs are coupled selectively to a common output pad in a time division multiplex sequence,

clock means connected to the switch means and to the circuit inputs whereby the switch means is controlled to effect said sequence and whereby the inputs are enabled in synchronism with said sequence, and

a light or infrared source coupled to the common output whereby, in use, the multiplexed output signal is modulated on to an optical or infrared carrier for transmission to the inputs of similar circuit devices,

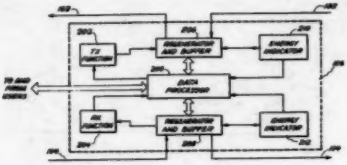
wherein each said circuit input is coupled to a respective photodetector whereby the optical signal is applied to that input, and

wherein, in use, said inputs are so controlled by the clock means that each said input is selectively enabled only for a respective time slot of a multiplexed signal received from similar circuit devices.

4,682,324
IMPLICIT PREEMPTIVE LAN

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,938
Int. Cl.[4] H04L 5/00
U.S. Cl. 370—85 12 Claims



1. A method for transmitting user message signals in a local area network having active stations wherein a subject station receives incoming message signals from a predominant station and transmits said incoming message signals to a subordinate station said method comprising the steps of:

(a) initiating transmission of said user message signal when the transmission medium of said network is idle and determining whether said predominant station is initiating transmission;

(b) completing transmission of said user message signal if said predominant station is not transmitting;

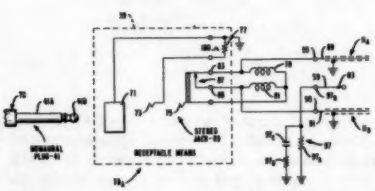
(c) terminating transmission of said user message signal if said predominant station is transmitting; and

(d) reserving the right at said subject station to transmit said user message signal and transmitting said user message signal after said predominant station has completed transmission.

4,682,325
SYSTEM FOR SELECTIVELY COUPLING A PLURALITY OF STATIONS INTO A SINGLE COMMUNICATIONS PATH

George Heys, Jr.; Rex A. Aleshire; Frank Hines, and William M. Belknap, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 27, 1984, Ser. No. 686,579
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—85 20 Claims



1. In a communications network having a plurality of stations including first and last stations and a single communications path having a preselected characteristic impedance, a system for selectively coupling the plurality of stations into the single communications path, said system comprising:

a plurality of tap boxes serially coupled into the single communications path; and a plurality of connection means for selectively coupling the stations to selected ones of said plurality of tap boxes, each of said tap boxes comprising:

a first impedance equivalent to the characteristic impedance of the single communications path;

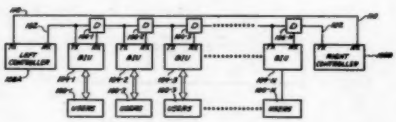
a test impedance; and

receptacle means having a first portion and being responsive to the coupling of a said connection means to said first portion for coupling said first impedance serially into the single communications path and for coupling the station associated with said connection means into the single communications path by way of said first impedance, said receptacle means having a second portion and being responsive to the coupling of said connection means to said second portion for coupling said test impedance to said connection means to enable the station associated with said connection means to test itself.

4,682,326
METHOD AND APPARATUS FOR MAINTAINING A DYNAMIC LOGICAL RING IN A TOKEN PASSING LAN

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 27, 1985, Ser. No. 802,482
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—89 14 Claims



1. Apparatus for maintaining a dynamic logical ring in a local area network including a plurality of active and passive stations, each having a unique station address, said active stations being adapted to transmit a media control signal from a predecessor station to a successor station in accordance with the order of the logical ring and to respond to said media control signal to transmit message signals within the network, said passive stations being adapted to enter the network by transmitting a media demand signal such that its address will be added to the logical ring to receive said media control signal, said apparatus comprising:

transmit means for transmitting and receiving message signals to and from said network, said transmit means being adapted to be coupled to said network;

memory means for recording the address of each station active in the local area network, said memory means being adapted to record said addresses in accordance with the order of the logical ring such that the order in which said media control signal is to be passed from station to station may be readily determined; and

data processing means adapted for receiving said message signals and transmitting said message signals via said transmit means, said data processing means being responsive to said media demand signal transmitted by an entering station to search said memory means to determine a predecessor and a successor to said entering station, said data processing means being further reponsive to said media demand signal for transmitting media entrance signals to add said entering station to the logical ring, one said media entrance signal being transmitted to the predecessor of said entering station such that said entering stations predecessor will transmit said media control signal to said entering station and one said media entrance signal being transmitted to said entering station such that said entering station will transmit said media control signal to the successor of said entering station, thereby adding said entering station to the logical ring.

4,682,327
POLYPHASE PHASE LOCK OSCILLATOR

Yasuyuki Okumura, Yokohama, and Kazuhiro Hayashi, Yokosuka, both of Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

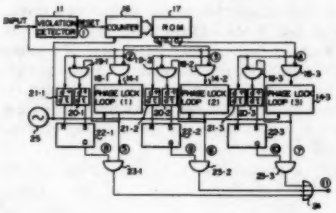
PCT No. PCT/JP85/00043, § 371 Date Apr. 29, 1985, § 102(e) Date Apr. 29, 1985, PCT Pub. No. WO85/03610, PCT Pub. Date Aug. 15, 1985

PCT Filed Feb. 2, 1985, Ser. No. 732,797

Claims priority, application Japan, Feb. 3, 1984, 59-17114; Jan. 28, 1985, 60-12542

Int. Cl.[4] H04J 3/06

U.S. Cl. 370—100 4 Claims



1. A polyphase phase lock oscillator for reception of a time division multiplex signal which has a plurality of channels with phase difference comprising:

detecting means for detecting a first bit of a reception frame which includes said plurality of channels

said first bit being detected by detecting a violation pattern of a reception signal using a sampling clock pulse which is higher than a clock pulse of a channel of said reception signal;

gate signal means for providing gate signals for each one of said channels said gate signals being individually based upon timing of said first bit from said detection means so that a gate circuit, controlled by each said gate signal, passes a channel signal;

regeneration means for regenerating a clock of a related one of said plurality of channels from a separated channel signal which is obtained by a related one of said gate signals from said gate signal means; and

output means for output of the regenerated clock obtained by said regeneration means, said regenerated clock being synchronized with said reception frame with said plurality of channels.

4,682,328
DYNAMIC MEMORY REFRESH AND PARITY CHECKING CIRCUIT

John R. Ramsay, Herndon, Va., and Zbigniew B. Styrna, Kanata, Canada, assignors to Mitel Corporation, Ontario, Canada

Filed Sep. 27, 1985, Ser. No. 781,023

Claims priority, application Canada, Aug. 15, 1985, 488829

Int. Cl.[4] G11C 29/00; G06F 11/10

U.S. Cl. 371—13 12 Claims

1. A circuit for refreshing, checking and correcting data signals stored in a dynamic memory, comprising:

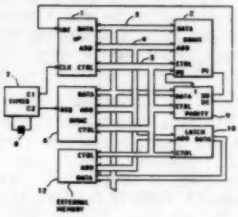
(a) a data bus for connection to said dynamic memory,

(b) a direct memory access controller for connection to said memory and said data bus, for periodically reading successive ones of said data signals such that said data signals appear on said data bus,

(c) a parity checking circuit, connected to said data bus, for detecting parity errors in said data signals and generating interrupt signals in response thereto,

(d) recovery means connected to said data bus and said parity checking circuit, for receiving said interrupt signals and generating and storing correct versions of said data signals in said dynamic memory in response thereto, and

(e) said recovery means being comprised of non-volatile memory means containing said correct versions of said data signals and means for retrieving said correct data signals from said non-volatile memory means and storing



said correct data signals in said dynamic memory in response to receiving said interrupt signals,

whereby successive ones of said data signals are refreshed as a result of being read by said direct memory access controller and parity errors are corrected as a result of said recovery means storing correct versions of said data signals in said memory.

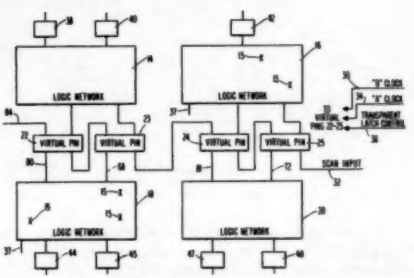
4,682,329
TEST SYSTEM PROVIDING TESTING SITES FOR LOGIC CIRCUITS

Daniel J. Kluth, 9767 Union Terrance La., Maplegrove, Minn. 55369, and Gary L. Engel, 21299 Viking Blvd., Wyoming, Minn. 55092

Filed Mar. 28, 1985, Ser. No. 717,077

Int. Cl.[4] G06F 11/00

U.S. Cl. 371—15 14 Claims



1. For use in a logic system having a system clock and switchable between a system mode and a test mode, the logic system having at least first and second semiconductor logic networks for performing system logic functions during the system mode test system comprising:

test signal means for applying a test signal to the first logic network,

control signal means independent of the system clock for producing first, second and third control signals,

virtual pin means coupled between and providing a site for testing of the first and second logic networks during the test mode and free of logic circuits common to the first and second logic networks and performing no system logic functions while the logic system is in the system mode,

a single control line indepedent of clock signals for applying all of the control signals of the control means to the virtual pin means independently of the system clock, and

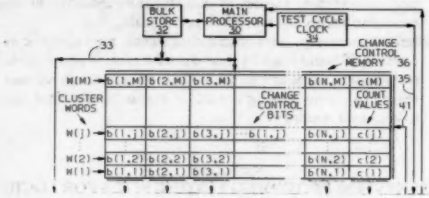
said virtual pin means including means for switching to the test mode in response to said first control signal, said switching means including means for storing the test signal from the first logic network in response only to said second control signal, said switching means for switching the logic system to the system mode in response to said third control signal and maintaining the system mode during cycling of the system clock whereby the first logic network is coupled to the second network through an effectively transparent and inactive virtual pin means performing no system logic functions.

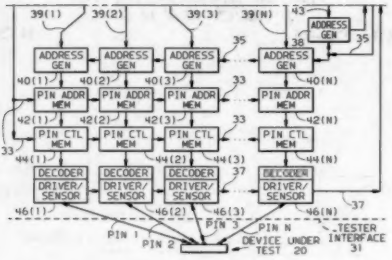
4,682,330

HIERARCHICAL TEST SYSTEM ARCHITECTURE

Ernest H. Millham, Catlett, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,428
Int. Cl.[4] G06F *11/00*; G01R *31/28*
U.S. Cl. 371—20 **4 Claims**





1. In a stored program complex logic tester, including a test cycle clock for controlling the sequence of test cycle intervals, and a tester interface having a plurality of N contacts which operatively connect respective terminals of a device under test to a respective one of a plurality of N driver/sensor pairs, each driver/sensor pair having a digital control input, a hierarchical test sequencer, comprising:

a change control memory having an address input, a plurality of N control bit outputs and a count value output, for storing a plurality of M cluster words, each j-th one of said M cluster words including a plurality of N change control bits b(i,j) and a count value C(j), (where i is an integer from 1 to N and j is an integer from 1 to M);

a first address generating means having a first input connected to said count value output and a second input connected to said test cycle clock, for synchronously changing the address applied to said address input of said change control memory in response to said count value output, to access said cluster words therein;

a plurality of N pin address memories, each corresponding to a respective i-th one of said N change control bit outputs and each having an address input and a data output, for storing a second plurality of instruction address values in an i-th one of said N pin address memories, said second plurality being the sum of the products of said count value C(j) times said change control bit b(i,j) for all values of j from 1 to M;

a plurality of N second address generating means, each having an input connected to a respective i-th one of said N control bit outputs and an input connected to said test cycle clock, and an output connected to said address input of a respective i-th one of said N pin address memories, for changing the address input to said respective i-th pin address memory in response to a first binary value of an i-th change control bit b(i,j) output by said change control memory;

a plurality of N pin control memories, each having an address input connected to said output of a respective i-th one of said N pin address memories, and a data output connected to said digital control input of a respective i-th one of said N driver/sensor pairs, for storing a plurality of pin function instructions accessible by said instruction address values, each said instruction controlling the test function of said respective driver/sensor pair during one of said test cycle intervals;

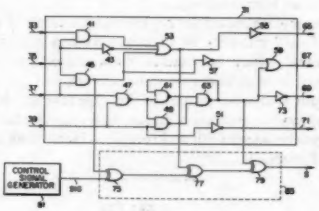
whereby an improved complex logic tester is formed.

4,682,331

LOGIC CIRCUIT WITH SELF-TEST

Shojiro Mori, Ageo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 18, 1984, Ser. No. 662,142
Claims priority, application Japan, Oct. 20, 1983, 58-196767
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—25 **20 Claims**



1. A logic circuit comprising:

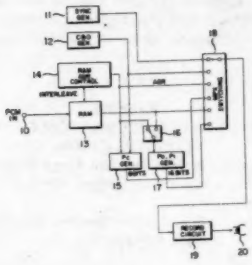
a logic section for receiving an exterior input signal and providing an exterior output signal, said logic section including a plurality of interior logic elements having corresponding input terminals and output terminals for providing interior logic signals, said input terminals and said output terminals being interconnected to perform logic operations to generate a value for said exterior output signal according to the value of said exterior input signal; and

a checking circuit for receiving a control signal and the values of said interior logic signals of said output terminals of selected interior logic elements, for logically combining the value of said control signal and said received values of said interior logic signals, and for generating an error detection signal having an expected value if each of said selected logic elements is operating correctly and an error value if at least one of said selected logic elements is operating incorrectly.

4,682,332
METHOD AND APPARATUS FOR RECORDING DIGITAL SIGNALS

Hiroo Okamoto; Masaharu Kobayashi; Takaharu Noguchi, and Takao Arai, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,658
Claims priority, application Japan, Jan. 25, 1984, 59-10098
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 7 Claims



1. A method of recording digital signals which are divided into blocks each having n digital signals (where n is a positive integer), a synchronizing signal providing a reference timing for reproduction, a control signal related to said digital signals, an identification signal for identifying the address of a block, an error detection code for detecting an error in said control signal and said identification signal, and an error detection and correction code for detecting and/or correcting an error in said n digital signals and said identification signal, said method comprising the steps of:

generating a first error detection code by performing an algebraic operation on said control signal and said identification signal in each block;

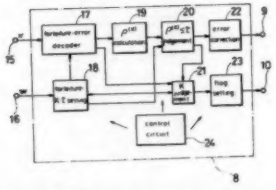
generating a second error detection and correction code by performing an algebraic operation on said digital signals and said identification signal in each block; and

combining said generated first error detection code and said generated second error detection and correction code together with the remaining signal in said block to form a recording block.

4,682,333
DECODER FOR DECODING A TWO-STAGE ENCODED CODE

Ken Onishi, Kyoto, and Yasuo Sugiyama, Ibaragi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,402
Claims priority, application Japan, Jun. 28, 1984, 59-135507
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—39 2 Claims



1. A decoder for decoding a code C which is two-stage encoded by a C_1 code ((N, K, D) Q dimensional code) and a C_2 code ((n, k, d) q dimensional code), comprising:

a C_1 decoder including;

error correction means for conducting an error correction of errors below the number [(D−1)/2]([M] is the biggest integer which does not exceed M) to output a decoded word at a first output terminal, and

a weight generator which generates a weight signal wj (j=1, 2, . . . , n) at a second output terminal when i (i=0 to [(D−1)/2]) errors are corrected and an error detection (correction disability) is judged;

a C_2 decoder for decoding the C_2 code including,

forfeiture/error correction means having input terminals connected to said first and second output terminals for judging the position j of the weight signal wj among a weight vector w in a received word r which is otained in accordance with the decoded word output from the C_1 decoder which satisfies the inequality $wj \geqq D/2-K$ (K=0, 1, . . . [(D−1)/2]), and conducting a forfeiture error decoding which satisfies the inequality

$$n\epsilon^{(k)}+2ne^{(k)} \leqq 2\tau/D$$

$n\epsilon^{(k)}$=the number of forfeitures when k=0, 1, . . . , (D−1)/2,
$ne^{(k)}$=the number of errors when k=0, 1, . . . , (D−1)/2,
$0 \leqq \tau < dD/2$,

weighted distance calculating means for calculating a weighted distance $\rho^{(k)}$ between a decoded word $r^{(k)}$ and the received word r when a decoded word in each of K=0, 1, . . . , [(D−1)/2] is obtained,

comparator means for comparing the weighted distance $\rho^{(k)}$ and an integer τ,

means for outputting the decoded word $r^{(k)}$ as a correct decoded word when $\rho^{(k)}$ is smaller than or equal to τ, and

means for outputting a correction disability signal when $\rho^{(k)}$ is larger than τ or no decoded word is obtained by the forfeiture error correction means, wherein

$$wj = \begin{cases} i \text{ when } i \text{ errors are corrected} \\ D/2 \text{ or } (D+1)/2 \text{ when an error detection is judged} \end{cases}$$

$$ir = (r_1, r_2, \ldots, r_n)$$

$$iw = (w_1, w_2, \ldots, w_n)$$

$$\rho^{(k)} = \sum_{j=1}^{n} \delta_j$$

$$\delta_j = \begin{cases} wj \text{ when } j \text{ is not a forfeiture position and } r_j^{(k)} = r_j \\ D - wj \text{ when } j \text{ is not a forfeiture position and } r_j^{(k)} \neq r_j \\ D/2 \text{ or } (D-1)/2 \text{ when } j \text{ is a forfeiture position.} \end{cases}$$

4,682,334
SYNCHRONOUS DATA TRANSMISSION METHOD AND DEVICE IMPLEMENTING SAME

Bernard Le Mouel, Saint Quay Perros; Hervé Le Bescont, and Jean-Paul Le Meur, both of Lannion, all of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, France

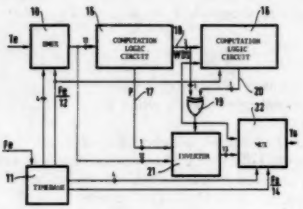
Filed May 20, 1985, Ser. No. 736,038
Claims priority, application France, May 23, 1984, 84 08084
Int. Cl.[4] H03K *5/26*; G08C *25/00*
U.S. Cl. 371—55 12 Claims

11. An encoder for implementing a synchronous data transmission method employing an MB 1C 1F type code in which the binary data to be transmitted is divided into successive blocks each of M bits (where M is an integer) each coded by a word comprising (M+2) bits made up of the M bits of the

block, complemented or not according to whether the word which would be obtained without complementing would have a word digital sum WDS equal to the difference between the number of marks (logic 1) and spaces (logic 0) of the word of the same or opposite sign as a running digital sum RDS equal to the difference between the numbers of ones and zeros in data already encoded, a complement bit C indicating whether complementing is applied or not and a frame bit complemented or not with the M bits of the block, whereby on decoding the blocks formed at the encoding stage may be reconstituted, in which method M is even and the value of the frame bit is determined according to a parity of each block of M bits, the encoder comprising:

a demultiplexer for transforming the data to be transmitted into successive blocks of M bits,

a circuit for computing the word digital sum WDS and the parity of each block connected to the output of said demultiplexer,



a complementing decision circuit for comparing the signs of the word digital sum WDS and the running digital sum RDS,

a circuit for computing the running digital sum RDS of the binary data already encoded on the basis of the output signal from said circuit computing the digital word sum and the output signal from said complementing decision circuit,

a complementing circuit controlled by said complementing decision circuit, said complementing circuit processing the block of M bits available at the output of said demultiplexer and its parity bit delivered by said circuit computing the word digital sum and parity, and

a multiplexer for transforming into an isochronous binary data bit stream the words delivered by said complementing circuit to which has been added a complement bit delivered by said complementing decision circuit.

4,682,335

COMPOSITE LASER OSCILLATOR

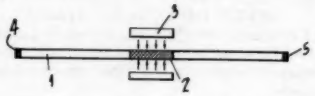
John L. Hughes, Canberra, Australia, assignor to Hughes Technology PTY LTD, Canberry, Australia

Filed Feb. 14, 1985, Ser. No. 701,496

Claims priority, application Australia, Feb. 15, 1984, PG3626

Int. Cl.[4] H01S *3/30*

U.S. Cl. 372—6 **11 Claims**



1. A scalable laser oscillator system comprising: a bundle of single mode, single polarization, thinly clad optical fibre laser oscillators, each optical fiber laser oscillator having two ends and a laser gain medium disposed between said ends, said bundle being coherently packed with the two ends of each of said fibre oscillators being optically polished and coated with layers of dielectric material such that said ends act as laser mirrors, one mirror being substantially 100% reflective at a lasing, which may be different for each oscillator and the other mirror being partially reflective at said lasing wavelength to allow for the transmission and emission of laser light generated within said oscillator, said bundle ends being compressed into two solid optically polished faces such that said 100% reflecting mirrors together form a reflecting face and said partially reflecting mirrors together form an output face, the remainder of said fibre bundle being loosely bound to allow for excitation of the laser gain medium;

said fibre oscillators which operate in response to control signals from a computer, reflect onto said end mirrors phases of outputs of each fiber oscillator are locked together and combine to form a single lobe output beam as a result of laser light leaking from individual fiber oscillators to neighboring fiber oscillators through said thin cladding.

4,682,336

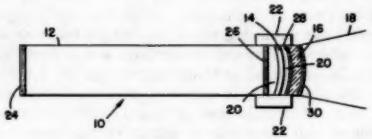
Q-SWITCHED LASER RESONATOR OF INTEGRAL CONSTRUCTION

James L. Hendrix, Northridge, and Leroy O. Braun, Malibu, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 29, 1986, Ser. No. 868,381

Int. Cl.[4] H01S *3/11*

U.S. Cl. 372—10 **18 Claims**



1. A Q-switched laser resonator having an integral construction comprising a laser rod, a Q-switch device having a first and a second surface, and an optical coupler, and further comprising:

first bonding means for bonding the first surface of said Q-switch device to an end surface of said rod; and

second bonding means for bonding the second surface of said Q-switch device to said coupler.

4,682,337

LASER DIODE WITH BURIED ACTIVE LAYER AND LATERAL CURRENT LIMITATION BY USE OF A SELF-ADJUSTED PN-JUNCTION

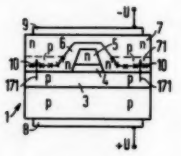
Markus-Christian Amann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 776,156

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435148

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—44 **16 Claims**



1. A method for producing a laser diode having a laser-active strip in a buried layer of a hetero-layer structure of III-V

semiconductor material wherein the buried layer is flanked by an inhibiting pn-junction such that a current limitation to the laser-active strip results, comprising the steps of:

providing a first semiconductor layer of first conductivity type and doped with a re-doping dopant of relatively high diffusion coefficient;

providing a second layer on the first layer which will become the laser-active strip;

providing a third semiconductor layer of second conductivity type on the second layer and having a dopant with a relatively low diffusion coefficient compared to the re-doping dopant;

structuring the second and third layers so as to create the laser-active strip with a layer lying thereover;

providing a fourth semiconductor layer of second conductivity type having a relatively weakly diffusing dopant compared to the re-doping dopant over the second and third layers and on the first layer where the second and third layers have been removed;

providing a fifth semiconductor layer of second conductivity type similarly doped like the fourth layer with a dopant of a low diffusion coefficient relative to the re-doping dopant but a degree of doping of the fourth layer being sufficiently higher than a degree of doping of the fifth layer such that given a re-doping of zones of the fifth layer by the high diffusion coefficient dopant of the first layer, the fourth layer still remains of second conductivity type at regions where the re-doping dopant diffuses through; and

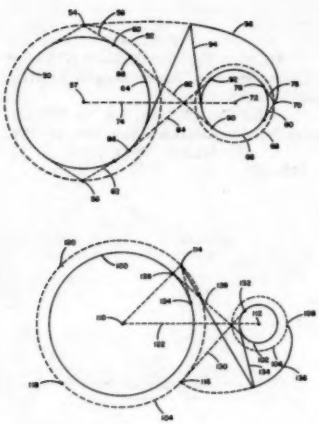
creating a re-doped zone by diffusing the re-doping high diffusion coefficient dopant from the first layer through the fourth layer and into zones of the fifth layer so as to convert said zones of the fifth layer from second conductivity type to first conductivity type and thus create said inhibiting pn-junction flanking the laser-active strip and between portions of the fourth and fifth layers.

4,682,338

MULTI-LAMP LASER PUMPING CAVITY

John D. Kuppenheimer, Jr., Tewksbury, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 26, 1985, Ser. No. 813,356
Int. Cl.[4] H01S 3/093
U.S. Cl. 372—72 **4 Claims**



1. An optically pumped laser comprising:

A. a cylindrical laser rod having a longitudinal central rod axis;

B. a plurality of cylindrical lamps for optically pumping the laser rod, the lamps having longitudinal central lamp axes parallel to the rod axis, the lamps being so located with respect to each other and to the laser rod as to define in cross section a base line associated with each lamp and extending between the rod axis and the lamp axis of the associated lamp, the base lines being equal in length and equiangularly spaced; and

C. a reflector wall consisting essentially of first and second wall sections associated with each lamp, the cross sections of the first and second wall sections associated with a given lamp essentially following first and second curves extending from a lamp cusp associated with the given lamp to second and first rod cusps, respectively, associated with the given lamp, the first and second curves consisting of the loci of points to which the sums of the distances, exterior to the laser rod and the given lamp, from first and second rod starting points, respectively, associated with the given lamp and from first and second lamp starting points, respectively, on the given lamp equal a fixed quantity, where:

i. the rod cusps are points spaced a predetermined rod stand-off distance from the rod surface, are equal in number to the number of lamps, are equiangularly spaced around the laser rod, and are equidistant from the adjacent base lines, the two rod cusps associated with a given lamp being a pair of rod cusps adjacent to each other and disposed on opposite sides of the base line associated with the given lamp;

ii. the first and second lamp starting points on a given lamp are the points of tangency therewith of first and second tangent lines, respectively, associated with the given lamp, the first and second tangent lines associated with a given lamp being the lines that (a) intersect the base line associated with the given lamp, (b) are tangent to the given lamp, (c) are tangent to the rod if the points of tangency of such lines on the laser rod are beyond the horizons of the first and second rod cusps, respectively, associated with the given lamp, and (d) otherwise include the first and second rod cusps, respectively, associated with the given lamp;

iii. the first and second rod starting points associated with a given lamp (a) are the first and second rod cusps, respectively, associated with the given lamp if the tangent lines associated with the given lamp include those rod cusps and (b) are otherwise the points of tangency with the laser rod of the first and second tangent lines, respectively, associated with the given lamp; and

iv. the lamp cusp associated with a given lamp is a point that is colinear with the given-lamp and laser-rod axes, is disposed on the side of the given lamp opposite the laser rod, and is spaced from the lamp surface by a lamp stand-off distance whose value is such that the effective lamp perimeter of the given lamp equals the part of the effective rod perimeter associated with the given lamp, where the effective lamp perimeter for a given lamp is the sum of the part of the lamp perimeter outside the lamp-cusp horizon plus twice the distance from the lamp cusp to the lamp-cusp horizon and where the part of the effective rod perimeter associated with a given lamp is the shortest distance outside the lamp between the rod cusps associated with the given lamp.

4,682,339

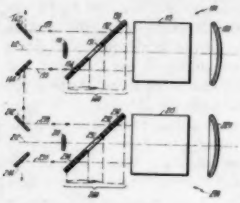
LASER ARRAY HAVING MUTUALLY COUPLED RESONATORS

Edward A. Sziklas, Glastonbury, and Gary E. Palma, Bloomfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1986, Ser. No. 890,587
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—95 **5 Claims**

1. A laser system having at least two independently pumped

unstable laser resonators, each having a feedback region in which optical radiation resonates, an output region in which output radiation exits from said feedback region and an output coupling means for coupling out a main beam from said output region in which laser extracted radiation extracted from a first one of said at least two unstable laser resonators is coupled unidirectionally into at least one other of said unstable laser resonators, whereby said extracted radiation from said first unstable laser resonator influences said at least one other unstable laser resonator, wherein the improvement comprises a



system in which each of said resonators is mutually and substantially symmetrically, bidirectionally coupled to said at least one other unstable resonator, through extraction means for extracting at least one coupling portion of said output radiation having, in total, a coupling radiation power and transporting means for transporting said at least one coupling portion of said output radiation that is mode-matched to an adjoint mode of said at least one other unstable laser resonator into at least one corresponding output region of said other one of said at least two unstable laser resonators to produce a laser system having a scaled-up laser output.

4,682,340

APPARATUS FOR AND METHOD OF EXTRACTING AN OUTPUT BEAM FROM A LASER SYSTEM

Timothy A. Dave, Mountain View, and Steve Guch, Jr., Saratoga, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 814,448, Dec. 30, 1985, abandoned. This application Apr. 14, 1986, Ser. No. 851,985

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—108 **15 Claims**

1. Apparatus for extracting an output beam from a laser system having a laser oscillator with an output, a phase conjugate mirror means spaced from said oscillator and aligned with the output of said oscillator to reflect said oscillator output in a direction back toward the oscillator, amplifying means aligned with said oscillator output between said oscillator and said mirror means, and at least one quarter-wave plate aligned with said oscillator output between said oscillator and said mirror means, the improvement comprising:

a birefringent element between said plate and said oscillator and having a surface traversing reflected and unreflected portions of said output at acute angles thereto to divert at least part of the reflected portion of said oscillator output away from said oscillator.

4,682,341

ELECTRIC ARC FURNACE

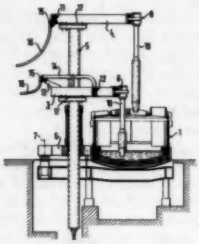
Joachim Ehle, Lautenbach; Klaus Timm, Wentorf, and Heinfried Ahlers, Asendorf, all of Fed. Rep. of Germany, assignors to Fuchs Systemtechnik GmbH, Willstätt-Legelshurst, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,252

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443574; May 10, 1985, 3516940

Int. Cl.[4] H05B *7/10*

U.S. Cl. 373—99 **17 Claims**



1. An electric arc furnace comprising: at least one electrode support arm having electrode holding means including a contact jaw supported on the electrode support arm and connected to a heavy-current conductor, and also an electrode clamping stirrup displaceable by an actuating rod which is arranged within the electrode support arm and which is longitudinally displaceable by an actuating device between a clamping position in which the electrode clamping stirrup presses the electrode against the contact jaw and a release position in which the electrode clamping stirrup releases the electrode, at least over a part of its length, on the outside, the electrode support arm having a region which is provided with a layer of copper or another good conductor of electricity, and which forms the heavy-current conductor for the supply of power to the contact jaw, the electrode clamping stirrup being electrically insulated with respect to the electrode support arm, the actuating rod having an end portion which extends towards the electrode and is electrically insulatedly mounted in a sliding guide.

4,682,342

SIGNAL TRANSMISSION SYSTEM

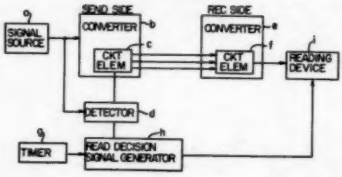
Kenichi Uetani, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 14, 1986, Ser. No. 829,028

Claims priority, application Japan, Feb. 19, 1985, 60-30846

Int. Cl.[4] H04K *1/10*

U.S. Cl. 375—38 **5 Claims**



1. A signal transmission system for transmitting source signals through dispersed circuit elements comprising a signal source for generating said source signals, detection means receiving said signal for detecting a change in said signals and for generating an output detection signal, a transmitting con-

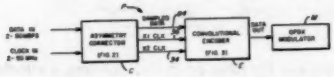
verter including a plurality of circuit elements for converting said source signals into a group of parallel signals and for transmitting said parallel signals when said circuit elements are actuated in response to said detection signal, said circuit element having a dispersion in operating time interval, read decision signal generating means for generating a read decision signal after lapse of the time interval, determined by the longest transient switching time of any one of said circuit elements, following the generation of the detection signal, a receiving converter receiving said parallel signals for converting the same into reception signals, and reading means for reading said reception signals of said converter when the read decision signal has been generated.

4,682,343

PROCESSING CIRCUIT WITH ASYMMETRY CORRECTOR AND CONVOLUTIONAL ENCODER FOR DIGITAL DATA

Harold J. Pfiffner, Los Angeles, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 11, 1984, Ser. No. 649,327
Int. Cl.[4] H04L *27/40*; G06F *11/10*
U.S. Cl. 375—59 **8 Claims**



1. A circuit for correcting input parameter variations in incoming signals of simultaneously transmitted but separately propagated data and clock pulse bits and for convolutionaly encoding the corrected signal, comprising:

(a) corrector means for providing a series of corrected data pulses at the incoming data rate to an encoder, wherein the corrector means comprises;

(1) means for receiving the incoming clock pulse bits;

(2) means for forming from the received clock pulse bits a regenerated clock signal, said forming means having frequency adjustment means whereby, frequency of regenerated clock signal is adjusted to coincide with the received clock signal;

(3) means for receiving the data pulse bits;

(4) phase adjusting means for adjusting the phase of the regenerated clock signal relative to the received data signal to maintain phase coincidence;

(5) mislock detector means for detecting and correcting a possible mislock condition whenever the phase adjustment means and the frequency adjustment means cooperate to create a false frequency lock between the received clock pulses and the regenerated clock signal,

(b) a convolutional encoder for encoding a series of digital data pulses, comprising:

(1) means for receiving the series of data pulses;

(2) means for encoding the series of data pulses to produce an encoded data stream wherein each bit of the series of data pulses is represented by two bits of the encoded data stream, and wherein the means for encoding further comprises;

(3) main register means for receiving and storing a series of a plurality of data pulses in corresponding number of shift register stages;

(4) first means for modulo-two adding the contents of a first group of selected ones of the shift register stages;

(5) second means for modulo-two adding the contents of a second group of selected ones of the shift register stages, said first and second groups being equal in number and differing from each other by at least one shift register stage;

(6) storage means for separately and serially loading the outputs of said first and second means for modulo-two adding;

(7) parallel register means for parallel loading the contents of said storage means;

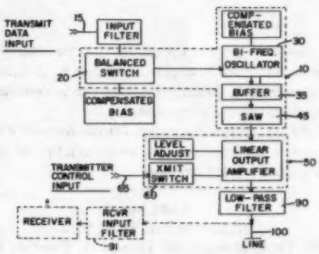
(8) said parallel register means further comprising means for serially transferring out the signals stored therein as coded digital data pulses.

4,682,344

RF FSK TRANSMITTER

Gerald L. Somer, Sebastopol, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 30, 1985, Ser. No. 760,686
Int. Cl.[4] H04L *27/12*; H03C *3/00*
U.S. Cl. 375—62 **14 Claims**



1. An rf modem transmitter including a digital to analog converter for converting an input data signal having a first and a second state to a modulated analog signal, and a transmitter amplifier for amplifying the analog signal and controlling a transmitted carrier, wherein:

said digital to analog converter comprises a master oscillator having a frequency determining means;

switchable means for altering the frequency of said master oscillator;

means for selectively switching said frequency altering means, said switching means switchable between a first and a second state and coupled to said frequency determining means such that said master oscillator operates at a first frequency when said switching means is in said first state, and a second differing frequency when said switching means is in said second state,

said switching means comprising an electronic switch means operatively coupled to said frequency altering means, said electronic switch means having a control input;

said switching means further comprising means for balancing the first-to-second state and second-to-first state switching times of said switching means such that said first-to-second state switching time of said switching means is equal to said second-to-first state switching time of said switching means,

said balancing means comprising means for delaying control signals, said delaying means having an input, and an output operatively coupled to said control input of said electronic switch means,

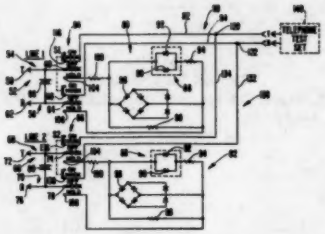
said delay means providing delayed control signals at its output for controlling said electronic switch means responsive to switching control signals applied to the delay means input, whereby said switching control signals corresponding to desired transitions of said electronic switch means from said first-to-second states are delayed an amount substantially equal to the second-to-first state switching time of said electronic switching means.

4,682,345

ADAPTER FOR COUPLING TOGETHER TWO SUBSCRIBERS' LINES TO A TELEPHONE TEST SET

William R. Elsenpeter, Camarillo, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 10, 1985, Ser. No. 806,804
Int. Cl.[4] H04M *1/21*; H04B *3/46*
U.S. Cl. 379—1 **7 Claims**



5. In a two-line adapter for connecting two telephone lines to a telephone test set in which a separate hold circuit is provided for selectively placing each of the telephone lines on hold, the improvement comprising:

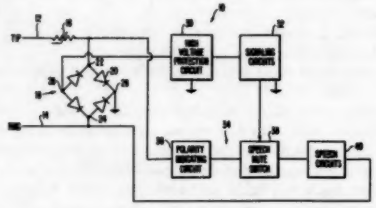
each hold circuit having means for continuously indicating the direction of current flow between a tip and ring line of an associated telephone line.

4,682,346

TELEPHONE TEST SET

Richard W. Faith, Oxnard, and Thomas W. Durston, Camarillo, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 24, 1985, Ser. No. 813,156
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—22 **25 Claims**



1. A telephone test set comprising:

(a) a first lead and a second lead which are respectively adapted to be connected to a tip line and a ring line of a telephone line;

(b) a full wave rectifying means for providing a rectified output of an input signal and having a pair of input terminals which are respectively connected to the first lead and the second lead and a pair of output terminals which respectively output a voltage of a first polarity and a second polarity;

(c) a shunt circuit coupled between the pair of input terminals of the full wave rectifying means which is comprised of a series connection of a means for transmitting and receiving voice communications and a switching means having an open circuit condition when a control signal of a first magnitude is applied to a control terminal and having a closed circuit condition when the control signal of a second magnitude is applied to the control terminal to permit current to flow within the shunt circuit;

(d) a signaling means coupled between the pair of output terminals for producing signals to place a telephone call over the tip and ring lines to a central office when in an activated state and for not producing signals when in an inactive state, and

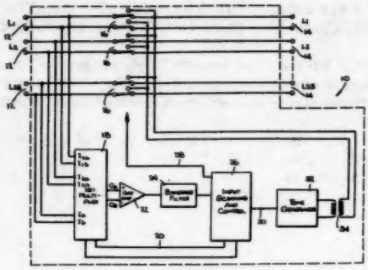
(e) control means responsive to the signaling means for producing the control signal having the first magnitude when the signaling means for placing a telephone call is in the active state and having the second magnitude when the signaling means for placing a telephone call is in the inactive state.

4,682,347

TELEPHONE LINE SELECTION AND ISOLATION METHOD AND APPARATUS

Daniel Lynch, Jackson, N.J., assignor to Keptel, Inc., Ocean, N.J.

Filed Feb. 10, 1986, Ser. No. 828,205
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—29 **19 Claims**



10. Apparatus for identifying and isolating a selected telephone line from among a plurality of telephone lines at a location remote from the central office, upon the application of a test signal to the selected line, comprising:

input/output means coupling each line of the plurality of lines to a respective subscriber line;

line selection means coupled to said input/output means, for selecting an evaluation line in a preselected sequence from among the plurality of lines in response to an input sequencing signal, and providing signals from said evaluation line as an evaluation output;

filter means coupled to said line selection means for filtering said evaluation output within a preselected wide frequency band and providing a filtered signal output;

control and detection means coupled to said filter means, operational in an initial detection mode for detecting the presence of an initial detection signal in an initial detection band within said wide frequency band during a preselected short time interval and, upon detection of said initial detection signal, operational in a validation mode for detecting the presence of a validated test signal by detecting the presence of a validation signal lying in a validation band within said initial detection band during a preselected number of sequential long time intervals, for providing as an output a "commence test" signal upon detection of said validated test signal or a said input sequencing signal upon failure to detect a said initial test signal during said short time interval or a said validation signal during any said long time interval; and

isolation means coupled to said control and detection means and to said input/output means, for disconnecting said evaluation line from said respective subscriber line in response to said "commence test" signal.

4,682,348

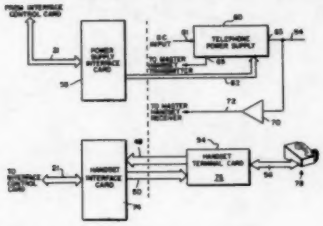
LIFE SAFETY AUDIO SYSTEM HAVING A VOICE SYNTHESIZER AND A CONSTANT VOLUME TELEPHONE NETWORK

Brian D. Dawson, and James R. Leacock, both of Lincoln, Nebr., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 16, 1985, Ser. No. 734,554
Int. Cl.[4] H04M *11/04*
U.S. Cl. 379—37 **3 Claims**

1. In a life safety system for monitoring a building or the like and having a plurality of detectors located throughout the

building for detecting alarm conditions, a plurality of speakers located throughout the building, a source of pre-stored voice messages which can be broadcast over the speakers, a telephone network, the improvement comprising a voice synthesizer for providing the source of pre-stored voice messages and the telephone network comprising a constant volume telephone network which comprises a telephone line, a plurality of telephones connected to the telephone lines including a master telephone having a transmitter, a telephone line power supply having an adjustable output voltage, sensing and adjusting



means for sensing the number of telephones off-hook and causing the output voltage of the telephone line power supply to be adjusted in response to the number of telephone off-hook, the telephone power supply comprising a voltage regulator having a DC input coupled to a source of DC voltage, a regulated DC output coupled to the telephone line, and an adjust input coupled to the sensing and adjusting means, and the telephone network includes means for coupling the master telephone's transmitter to the adjust input of the voltage regulator.

4,682,349

SWITCHING SYSTEM WITH VIDEO SWITCHING MATRIX

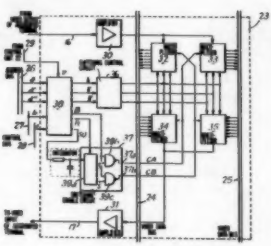
Pierre Sorriaux, 13, Place G. Braque, 95100 Argenteuil, France

Filed Apr. 8, 1985, Ser. No. 720,772

Claims priority, application France, Apr. 10, 1984, 84 05669

Int. Cl.[4] H04Q *3/52*; H04N *5/268*

U.S. Cl. 379—54 **4 Claims**



1. Switching system with a video switching matrix of the type used for setting up a dual video connection between a calling terminal and a called terminal in a telecommunication network re-grouping an array of N subscriber terminals each of which is provided with means for transmitting and receiving video signals, wherein said video switching matrix comprises:

(a) first and second data bus, each one comprising n conductors or channels for routing the video signals,

(b) at least one address bus,

(c) control conductors, and

(d) an array of N switching points, each one being associated to a respective subscriber terminal and being connected to said buses and control conductors each switching point comprising;

first and second output switches each having one data input, n data outputs, one validation input and control inputs, the data inputs of said output switches being jointly connected to the video transmitting means of the associated terminal, the n data outputs of the first output switch being connected to the first data bus and the n outputs of the second output switch being connected to the second data bus,

first and second input switches each having n data inputs and one data output, one validation input and control inputs, the data output of said input switches being jointly connected to the video receiving means of the associated terminal, the n data inputs of the first input switch being connected to the first data bus and the n data inputs of the second input switch being connected to the second data bus,

a circuit receiving address signals transmitted on the address bus and producing control signals applied in parallel to the control inputs of said output and input switches, for controlling said switches in order to select on each data bus a channel corresponding to the received address, and

a circuit receiving the signal transmitted on the control conductors and having a first output connected in parallel to the validation inputs of the first output switch and of the second input switch and a second output connected in parallel to the validation inputs of the second output switch and of the first input switch, so as to, enable depending on the signals received from said control conductors, either the pair formed by the first output switch and the second input switch, or the pair formed by the second output switch and the first input switch, to allow the setting up of a connection between the video transmission means of the associated terminal and the channel selected on one of the data buses, and of a connection between the channel selected on the other data bus and the video receiving means of the associated terminal.

4,682,350

EQUIPMENT FOR WIRELESS TELEPHONE TRANSMISSION

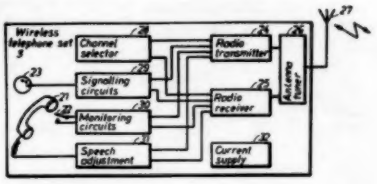
Dag E. Akerberg, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 598,353, Mar. 6, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,222

Claims priority, application Sweden, Jul. 6, 1982, 8204187

Int. Cl.[4] H04N *11/00*

U.S. Cl. 379—61 **7 Claims**

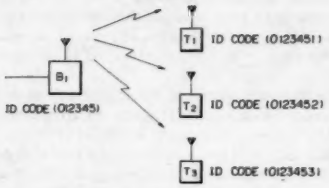


1. In a telephone communication system including at least a first unit and a second unit for audio information wherein each of the units includes a radio transmitter and a radio receiver, the method of radio communicating audio information between the units comprising the steps of dividing telephone audio information communication time into a plurality of equal time slots, dividing each time slot into a first and second period, during each first period radio transmitting from one of said units over a radio channel having a given range of frequencies to the other of said units and during each second period radio transmitting from said other unit to said one unit over said radio channel, the duration of said periods with respect to each other being a function of which transmitter is active at a given time.

4,682,351
CORDLESS TELEPHONE SYSTEM

Masayuki Makino, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 23, 1985, Ser. No. 790,329
Claims priority, application Japan, Oct. 29, 1984, 59-225691
Int. Cl.[4] H01H *11/08*
U.S. Cl. 379—62 6 Claims



1. A cordless telephone system including a single base station and a plurality of mobile stations which are connectable to the base station over a radio link:

said mobile stations each being provided with an identification code which is different from indentification codes assigned to the other mobile stations, said identification code being indicative of a master-slave relationship of said mobile station to the other mobile stations and a particular priority order of said mobile station with respect to reception of a telephone call;

said base station being constructed to determine whether any of the mobile stations which has originated a telephone call is a master mobile station or a slave mobile station referencing the identification code assigned to said particular mobile station and, if said mobile station is a master station, connect said mobile station to a subscriber's line to allow dial signals to be transmitted and, if said mobile station is a slave station, inhibit transmission of dial signals although connecting the mobile station to the subscriber's line;

said base station being further constructed to, at the time of reception of a telephone call, transmit control signals sequentially to the mobile stations on a time division basis according to the order of priority;

whereby the master mobile station is capable of originating and receiving a telephone call, while each of the slave mobile stations is capable of only receiving a telephone call.

4,682,352
UNIVERSAL MODEM RECEIVER TRANSMITTER

Stephen J. Durham, Cupertino, Calif., assignor to Cermetek Microelectronics, Inc., Sunnyvale, Calif.

Filed Aug. 20, 1985, Ser. No. 767,523
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—98 7 Claims

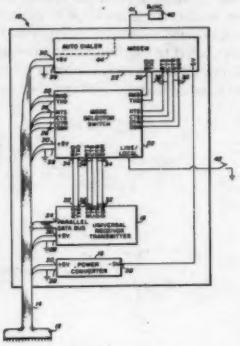
6. A retrofit modem for installing in a host data terminal, comprising:

connection means for connecting to said host data terminal;

universal receiver transmitter means connected to said connection means for converting data format;

modem means for interfacing said host data terminal to telephone lines; and

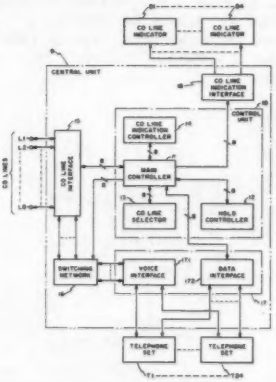
mode selector switch means connected to the universal receiver transmitter means and to both the connection means and the modem means, for connecting a serial data bus side of the universal receiver transmitter means selectively between said host data terminal and the modem means.



4,682,353
KEY TELEPHONE SYSTEM

Masayoshi Inoue; Kenichiro Hirano, and Ryoichi Tanihata, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Mar. 18, 1986, Ser. No. 840,732
Claims priority, application Japan, Mar. 20, 1985, 60-57329
Int. Cl.[4] H04M *3/42, 1/00*
U.S. Cl. 379—163 9 Claims



1. A key telephone system comprising:

a plurality of telephone sets, each set having a hold button for temporarily holding a central office line over which a communication is being held, a plurality of call park lamps for temporarily indicating that said central office line is being held, a plurality of call park buttons individually associated with said call park lamps, an outgoing call button for seizing an idle one of the central office lines when an outgoing call is to be initiated, and an answer button for seizing one of the central office lines over which an incoming call is being received so as to respond to said incoming call;

at least one external indicator for indicating various states of each of the central office lines; and

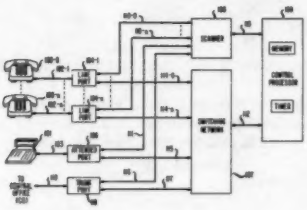
a central unit having hold control means for selectively energizing said call park lamps to indicate when said central office lines are being held responsive to an operation of said hold button and for controlling a response to that central office line in response to an operation of one of said call park buttons, central office line selecting means for selecting and seizing an idle one of the central office lines in response to an operation of said outgoing call button and for selecting and seizing one of the central office lines over which an incoming call is being received in response to an operation of said answer button, and central office line indication control means for controlling said external indicator to indicate various states of said central office lines.

4,682,354

AUTOMATIC CALL COVERAGE FOR UNATTENDED PBX STATIONS

Vincent D. Vanacore, Boulder, Colo., assignor to AT&T Company and AT&T Information Systems, Inc., both of Holmdel, N.J.

Filed Dec. 4, 1984, Ser. No. 677,802
Int. Cl.[4] H04M *3/50, 3/54*
U.S. Cl. 379—211 **22 Claims**



1. In a telephone switching system serving a plurality of station devices connected to associated port circuits where a processor controls interconnections between said port circuits in response to service requests received from said station devices, an automatic call coverage arrangement comprising:

means responsive to a first incoming call to one of said station devices remaining unanswered for a predetermined length of time for storing an indication that said first incoming call has not been answered;

means responsive to said stored indication for routing said first incoming call to a designated coverage facility; and

said routing means responsive to said stored indication for additionally routing all subsequently received incoming calls, that are directed to said one station device, to said designated coverage facility in lieu of ringing said one station device.

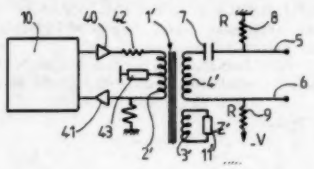
4,682,355

ELECTRONIC FEEDING BRIDGE FOR A SPACE DIVISION SWITCHING NETWORK

Francois P. Bailly, Palaiseau, and Alain Bourgoin, Dourdan, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sep. 13, 1984, Ser. No. 650,181
Claims priority, application France, Sep. 15, 1983, 83 14693
Int. Cl.[4] H04B *3/16*
U.S. Cl. 379—346 **4 Claims**

1. An electronic feeding bridge for a switching network, comprising: a pair of two wires adapted to be connected on the one hand to a sub set, on the other hand to the two ends of a first winding of a transformer via at least one capacitor connected between one of the ends of said first winding and the associated wire of said pair, the transformer comprising a second winding connected to said switching network and the two wires of said pair being respectively connected to two feed resistors, one taken to earth, the other to a feed potential, a third winding to which a negative impedance circuit is connected, so as to cooperate, in alternating current, with the feed resistors and thus to present in parallel on said pair of wires,



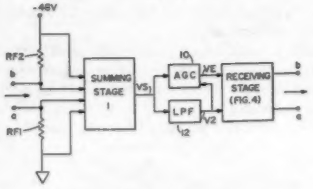
toward the sub set with respect to the capacitor, an impedance greater than that of the two feed resistors connected in series, and a disabling line connected to said negative impedance circuit such that oscillations are avoided across said sub set when lines connected to said sub set are open.

4,682,356

APPARATUS FOR TRANSMITTING AND/OR RECEIVING BALANCED SIGNALS ON A TWO-WIRE TELECOMMUNICATION LINE

Morris L. Minch, Coral Springs, and Theodore W. Wagner, West Palm Beach, both of Fla., assignors to Siemens Corporation, New York, N.Y.

Division of Ser. No. 350,028, Feb. 18, 1982, Pat. No. 4,485,277, which is a continuation-in-part of Ser. No. 137,810, Apr. 4, 1980, abandoned. This application Jul. 2, 1984, Ser. No. 627,243
Int. Cl.[4] H04B *3/04*
U.S. Cl. 379—347 **2 Claims**



1. A unidirectional repeater circuit for a two-wire branch of a four-wire telecommunication line comprising

a first summing stage having four inputs and an output, a first input being connected to a first wire of said two-wire branch of said four-wire telecommunication line via a first resistor, a second input being connected directly to said first wire, a third input being connected to a second wire of said two-wire branch of said four-wire telecommunication line via a second resistor, and a fourth input being connected directly to said second wire;

a gain control stage connected to the output of the first summing stage, the gain control stage for supplying a control signal and an AC signal at first and second outputs respectively; and

a receiving stage connected to the first and second outputs of the gain control stage for providing an output to a two-wire telecommunication line, the receiving stage comprising first and second operational amplifiers, the first operational amplifier being connected to a first reference voltage at its non-inverting input and having its output connected to its inverting input via a third resistor and to a first wire of the two-wire telecommunication line via a fourth resistor, the second operational amplifier having its non-inverting input connected to a second reference voltage and to the second output of the gain control stage, its output being connected via a fifth resistor to a second wire of said two-wire telecommunication line, via a sixth resis-

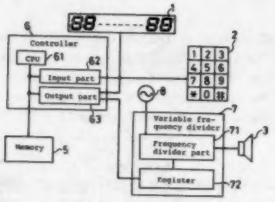
tor to its inverting input and via a seventh resistor to the inverting input of the first operational applifier.

4,682,357

AUTOMOBILE TELEPHONE APPARATUS

Etsuro Irino, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 697,501
Claims priority, application Japan, Feb. 16, 1984, 59-21507[U]
Int. Cl.[4] H04M 1/274
U.S. Cl. 379—356 **4 Claims**



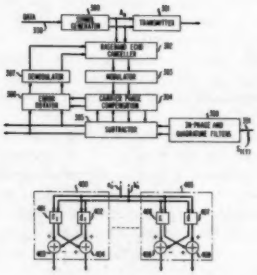
1. An automobile telephone apparatus comprising:
a keyboard for inputting a full telephone number or a repertory dialing code for a telephone number,
a memory for storing telephone numbers which are accessible by said repertory dialing code number,
a controller which generates a first signal when a number inputted from said keyboard is a repertory dialing code for one of the stored telephone numbers and generates a second signal when the number inputted from said keyboard is not a repertory dialing code for any of said stored telephone numbers,
a signal generator which generates a sound signal of a first kind at reception of the first signal and a sound signal of a second kind at reception of the second signal, and
a sound generator for generating different sounds at receptions of the sound signals of different kinds.

4,682,358

ECHO CANCELLER

Jean J. Werner, Holmdel, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 4, 1984, Ser. No. 677,974
Int. Cl.[4] H04B 3/23
U.S. Cl. 379—411 **12 Claims**



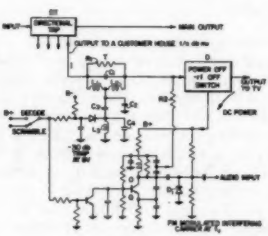
1. Apparatus for forming a complex cancellation signal representative of the echo generated when a modulated data signal is applied to a communication channel, said modulated data signal having in-phase and quadrature phase components formed in response to a sequence of complex symbols, said apparatus comprising
(1) means for forming in-phase and quadrature phase components of a signal received from said communication channel, said received signal including an echo component, and
(2) means for forming a current estimate of said components of said received signal as a function of the sum of the weighted product of (a) the values of current and past ones of said symbols in said sequence, and (b) a plurality of adaptively updated tap coefficients,
wherein said current estimate forming means includes
(3) at least four transversal filters each arranged to have a transfer characteristic which adapts independently of the others, a first pair of said transversal filters responsive to the real part of the current and past symbol values in response to which said in-phase component of said modulated data signal was formed and a second pair of said transversal filters responsive to the imaginary part of the current and past symbol values in response to which said quadrature phase component of said modulated data signal was formed, and
(4) means for algebraically combining the outputs of the filters from each of said pairs to form components of said complex cancellation signal which form independently of each other.

4,682,359

TELEVISION PICTURE AND SOUND SCRAMBLER AND METHOD

Kantilal Mistry, Freehold, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Oct. 15, 1984, Ser. No. 661,091
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—7 **7 Claims**



1. A method of scrambling television signals comprising channel visual carrier frequency and audio frequency-modulated carrier frequency signals, that comprises, trapping the visual carrier frequency to attenuate the same, injecting an interfering frequency-modulated carrier signal upon the attenuated visual carrier frequency at substantially the same carrier frequency as the visual carrier, adjusting the amplitude of the interfering signal to be substantially that of the audio carrier frequency signal, and adjusting the frequency deviation of the interfering signal frequency modulation to be substantially higher than that of the standard audio frequency modulation of the audio carrier frequency to provide effective scrambling of the television visual signal and overpowering the audio signal.

4,682,360

VIDEO TRANSMISSION SYSTEM

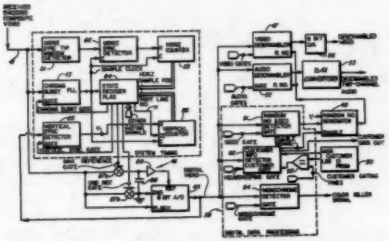
Jeffrey E. Frederiksen, 603 W. Haven Dr., Arlington Heights, Ill. 60005

Filed Dec. 22, 1983, Ser. No. 564,405
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—10 **3 Claims**

1. A video transmission system providing secure transmis-

sion of a composite video signal over a communications channel for reception by designated customers,

the composite video signal having scrambled video information in frames having a predetermined number of lines, synchronization information indicating the starting positions of the lines and the first line in each frame, and customer data for designating individual customers permitted to receive the composite video signal and descramble the video information therein,



the video transmission system having an encoder for digitizing a composite video signal and scrambling the resulting digital video signals, and a decoder for each customer for receiving the scrambled video signal and descrambling the video signal,

multiple lines of the video signal in each frame including a max reference pulse located outside of the video portions of the lines for providing a full scale signal to establish a reference for analog-to-digital conversion of the composite video signal.

4,682,361

METHOD OF RECOGNIZING SPEECH PAUSES

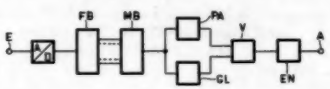
Bernd Selbach, Eckental, and Peter Vary, Herzogenaurach-Niederndorf, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,994

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243232

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—46 **8 Claims**



1. A method of detecting speech pauses from the short-time spectrum of a speech signal which may be disturbed by noise signals superposed on it, characterized in that at each clock instant $\tau(n)$ of a central clock

(a) a set W(n) consisting of M Fourier coefficients Y1(n), Y2(n) . . . YM(n) of the short-time spectrum of the disturbed speech signal is determined from digital samples of such signal,

(b) from the M Fourier coefficients of the set W(n), and the NM Fourier coefficients of all of the sets W(n−1), W(n−2) . . . W(n−N) of such coefficients at N prior clock instants, the short-time mean value G(n) of all such Fourier coefficients is determined,

(c) the noise signal power P(n) is estimated as a function of an estimate P(n−1) thereof at the preceding clock instant and of the short-time mean value G(n),

(d) a smoothed short-time value GG(n) is determined as a function of the short-time mean value G(n) at clock instant $\tau(n)$ and the short-time mean values at a plurality of preceding clock instants,

(e) if the smoothed short-time mean value GG(n) several times in succession falls below a first threshold (S) proportional to the estimated noise signal power P(n), a signal is produced indicating the presence of a speech pause.

4,682,362

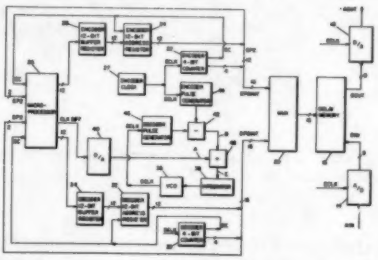
GENERATING NARROWLY-SEPARATED VARIABLE-FREQUENCY CLOCK SIGNALS

Richard E. DeFreitas, North Chelmsford, and Daniel T. Sullivan, Bolton, both of Mass., assignors to Analog and Digital Systems, Inc., Wilmington, Mass.

Filed Sep. 24, 1985, Ser. No. 779,785

Int. Cl.[4] H03L *7/16*

U.S. Cl. 381—61 **4 Claims**



1. Circuitry for generating clock signals of slightly different frequencies, said circuitry comprising

an oscillator for generating a first clock signal,

a voltage-to-frequency converter means for generating a second clock signal,

comparison means for comparing the frequencies of said first and second clock signals and generating a difference signal representative of the difference in frequency between said signals,

summing means for summing said difference signal and a frequency-difference-command signal (e.g., CLKDIFF),

integrating means for integrating the output of said summing means to provide an integrator output, and

means for driving said voltage-to-frequency converter means with said integrator output,

whereby the frequency of said second clock is forced to approach the frequency of said first clock plus the frequency difference prescribed by said frequency-difference-command signal.

4,682,363

AMPHIBIOUS PERSONAL AUDIO SYSTEM

Jerry Goldfarb, 30 Brodwood Dr., Stamford, Conn. 06902, and Bruce Klenoff, 199 North St., Stamford, Conn. 06901

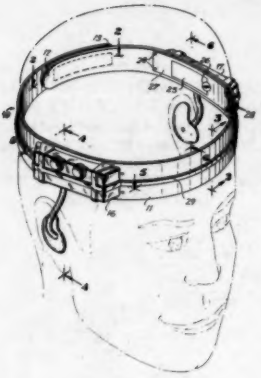
Filed May 23, 1985, Ser. No. 737,009

Int. Cl.[4] H04R *1/10, 1/44*

U.S. Cl. 381—74 **20 Claims**

1. An amphibious personal audio system, comprising: band means for encircling a person head's; audio means secured to the band means for generating an audio signal, the audio means being hermetically sealed; speaker means secured to the band means and means electrically coupling to the speaker means to the audio means for converting the audio signal to an audible sound, the speaker means and the electrical coupling means being hermeticaaly sealed; and earpiece means acoustically coupled to the speaker means for transmitting the sound to the

person's ears, the earpiece means having an opening for transmission of sound to the user's ear canal, the earpiece means



being adapted to substantially hermetically seal around the user's ear canal.

4,682,364

FADER CIRCUIT ARRANGEMENT IN ELECTRICAL REPRODUCING APPARATUS AND FADER CONTROL FOR SUCH AN ARRANGEMENT

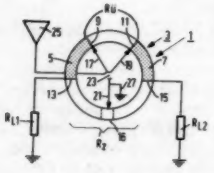
Joachim A. Dünnebacke, Herborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1985, Ser. No. 754,099

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3427000

Int. Cl.[4] H03G *3/00*

U.S. Cl. 381—109 **11 Claims**



1. A fading circuit in an electrical reproduction apparatus for fading the signals applied to first and second reproduction units comprising:

a variable resistor having first and second ends of a resistance element connected to said first and second reproduction units, respectively, and having a movable wiper means which, when moving along said resistance element in a first direction, forms a fading resistance which decreases from a maximum to a minimum value in series with said first reproduction unit, and a fading resistance which increases in resistance from a minimum to a maximum in series with said second reproductions unit; and

an additional variable resistor having a wiper means coupled with said first variable resistor wiper means, said additional variable resistor means providing first and second variable resistances in parallel with said first and second reproduction units, said first variable resistance increasing from a minimum to a maximum while said second variable resistance decreases from a maximum to a minimum when said first variable resistor wiper means moves in said first direction.

4,682,365

SYSTEM AND METHOD FOR PREPARING A RECOGNITION DICTIONARY

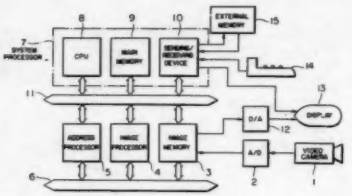
Miyahiko Oritz; Yoshiki Kobayashi, and Tadaaki Mishima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,559

Claims priority, application Japan, Jun. 8, 1984, 59-116462

Int. Cl.[4] G06K *9/68*

U.S. Cl. 382—14 **7 Claims**



1. Method for preparing a recognition dictionary of decision tree structure, by which identification (classification) is effected, by the use of electronic data processing means while allocating each of a plurality of features prepared for objects to be recognized by recognition means to each of the nodes of a decision tree comprising

(a) a step of estimating the maximum depth in representation of node level of the decision tree necessary for recognizing one of the objects to be recognized,

(b) a step of estimating the sum of node numbers, which is the total sum of the depths in representation of node level of the decision tree necessary for recognizing all of the objects to be recognized, and

(c) a step responsive to a requirement to said system of extracting (selecting) independently a feature, for which the maximum estimated depth according to said step (a) is the smallest, or a feature for which the sum of the estimated node numbers according to said step (b) is the smallest.

4,682,366

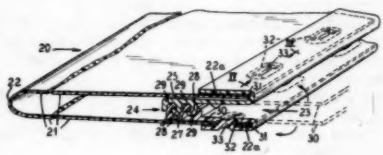
ATTACHMENT OF PLASTIC ZIPPER TO INCOMPATIBLE BAG WALL WEB

Steven Ausnit, New York, and Per Bentsen, Suffern, both of N.Y., assignors to Minigrip, Incorporated, Orangeburg, N.Y.

Filed Aug. 27, 1985, Ser. No. 769,894

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—65 **18 Claims**



1. In a bag comprising a thin web material body having side margins and with an openable top flanked by opposed upwardly projecting pull flanges, and an extruded plastic zipper means carried by said body along said pull flanges, and wherein:

said bag body and said zipper means are fusibly incompatible;

said zipper means comprising a pair of fusible extruded plastic strips extending from side-to-side of said bag to and between said margins and having complementary separably interlockable zipper profiles and located parallel to and substantially below upper ends of said pull flanges;

each of said strips having a base parallel to said pull flanges;

holes in portions of the material of said bag body and aligned with said strips;

and fused connecting anchors extending from said zipper strips through said holes and permanently attaching said zipper strips to said bag body in a manner to effect cooperation of said strips with said pull flanges so that the profiles of said strips can be separated from an interlocked relation by pulling said pull flanges in respective opposite directions;

said holes being elongated with their length parallel to said zipper strips and said anchors being of elongated cross section complementary to said holes so as to strengthen the anchoring relationship of said anchors and said portions of the bag material and to resist stresses of pulling forces applied to said portions of the bag material bag and through said anchors when pulling the pull flanges apart and thereby pullingly separating the zipper profiles from their interlocked relation.

10. A method of making a bag equipped with extruded plastic reclosable zipper means, comprising:

forming a bag body from thin web material and having opposite side margins and an openable top flanked by opposed upwardly projecting pull flanges;

providing a pair of opposed extruded plastic zipper strips fusibly incompatible with the material of said bag body and having complementary separably interlockable zipper profiles and each strip having a base;

assembling said profile strips along said pull flanges with said bases parallel to said pull flanges, and locating said strips with their profiles substantially below upper ends of said pull flanges;

permanentaly attaching said zipper strips to said bag body by fusibly connecting anchors from said zipper strips through holes in said bag material in a manner to effect cooperation of said strips with said pull flanges so that said profiles of said strips can be separated from an interlocked relation by pulling said pull flanges in respective opposite directions;

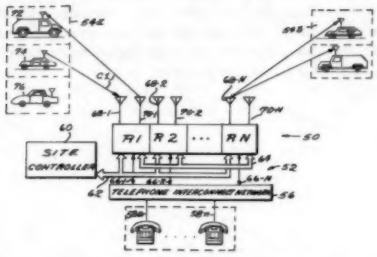
and elongating said holes lengthwise of said fastener strips and correspondingly elongating the cross section of said anchors so as to strengthen the anchoring relationship of said anchors and said bag material to resist stresses from pulling forces applied to said bag material by said anchors when pulling the pull flanges apart and separating the profiles from an interlocked relation.

4,682,367

MOBILE RADIO COMMUNICATIONS SYSTEM WITH JOIN FEATURE

Jeffery S. Childress, Lynchburg; Marc A. Dissosway, Forest, and Houston H. Hughes, III, Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Nov. 13, 1985, Ser. No. 797,503
Int. Cl.[4] H04B *7/14, 1/00*
U.S. Cl. 455—17 **12 Claims**



1. In a trunking radio transceiver of the type which operates on a plurality of channels, the improvement comprising:

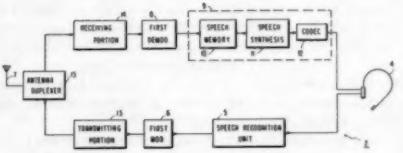
means for controlling said transceiver to (1) transmit, on a non-used channel X, a request to join ongoing transceiver communications being conducted over a further channel Y, (2) thereafter leave said channel X and scan said plural channels, and (3) thereafter tune to said channel Y in response to signalling transmitted to said transceiver so as to permit transceiver participation in said ongoing transceiver communications thereon.

4,682,368

MOBILE RADIO DATA COMMUNICATION SYSTEM USING A SPEECH RECOGNITION TECHNIQUE

Tsutomu Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,067
Claims priority, application Japan, Mar. 27, 1984, 59-57457
Int. Cl.[4] H04B *7/00*
U.S. Cl. 455—38 **6 Claims**



1. A data communication system which allows an operator to input data in the form of a speech signal comprising:

a fixed unit including

control means for controlling generation of an operation command code sequence for an instruction to said operator and for processing a code associated with a speech signal supplied by the operator in response to the instruction,

first modulator means for modulating the operation command code sequence to generate a first modulated signal, and

first demodulator means for demodulating a received signal to generate said code associated with said speech signal; and

at least one portable unit including

speech recognition means for recognizing said speech signal and outputting said code associated with the speech signal,

second modulator means for modulating the code associated with said speech signal to generate a second modulated signal, said second modulated signal being the signal received by said first demodulator means,

second demodulator means for demodulating the first modulated signal to generate said operation command code sequence,

speech synthesis means for generating a speech signal associated with the operation command code sequence, and

a headset operated by the operator for receiving the speech signal uttered by the operator and receiving the speech signal supplied from the speech synthesis means.

4,682,369

RIPPLE AND DROOP REDUCTION CIRCUIT

Elliott G. Schrader, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 4, 1985, Ser. No. 707,938
Int. Cl.[4] H04B *1/04*
U.S. Cl. 455—127 **7 Claims**

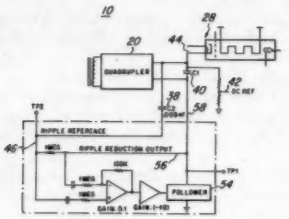
1. A ripple reduction circuit for a radar transmitter, comprising:

(a) power supply means having a supply output;

(b) supply capacitor means having first and second electrodes and coupled across said supply output;

(c) ripple and droop reduction means comprising;
(d) first means including an operational amplifier having a pair of inputs and an output for providing a signal on said output which is a function of the difference between signals on the input thereof;
(e) ripple reference measuring means coupled between a first electrode of said supply capacitor means and one input of said operational amplifier; and
(f) ripple reduction means coupled between the second electrode of said supply capacitor means and the other input of said first means including an operational amplifier;
(g) the output of said first means including an operational amplifier being coupled to said ripple reduction means and said second electrode of said supply capacitor means.

7. A radar transmitter comprising:
(a) a power supply means;
(b) a power supply capacitor having a first plate operatively connected to the power supply means;
(c) a ripple and droop reduction means operatively connected to the power supply means across the power supply capacitor to a second plate of the power supply capacitor for reducing substantially the ripple and droop voltages from the power supply capacitor; and
(d) an electronic tube operatively connected to the power supply capacitor for producing an electron beam for modulation by an RF input single, wherein
(e) the ripple and droop reduction means comprises a ripple



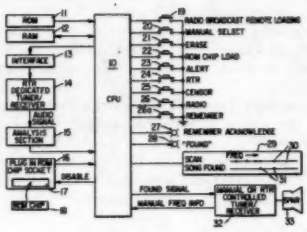
reference obtaining means operatively connected to the power supply, and a ripple reduction means operatively connected to the second plate for reducing substantially the ripple of the power supply when it is off and the droop of the power supply capacitor when the power supply is on, wherein
(f) the ripple reduction output means includes an operational amplifier ac connected across the beam supply filter capacitor and outputting a low level, single ended version of the ac ripple and droop appearing across the beam supply filter capacitor, an inverter amplifier means operatively connected to the operational amplifier for inverting its output signal and amplifying its absolute level to that appearing across the beam supply filter capacitor to provide an inverted image of the ac across the beam supply filter capacitor, and a follower means operatively connected to the inverter means for providing a low impedance output for insertion in series with the beam supply filter capacitor whereby the ac component of the voltage between the electronic tube and ground is reduced substantially, wherein
(g) the follower means includes at least one stage of emitter follower transistors operatively connected to the inverter means, and wherein
(h) the at least one emitter follower stage includes an NPN transistor and a PNP transistor having their bases connected to the inverter amplifier and their emitters connected together through a pair of reversed diodes and a capacitor.

4,682,370

APPARATUS FOR AUTOMATICALLY DETECTING AND PLAYING DESIRED AUDIO SEGMENTS OVER A BROADCAST RECEIVER

Gordon H. Matthews, 5301 Mariners Way, Plano, Tex. 75075

Continuation-in-part of Ser. No. 434,868, Oct. 15, 1982, Pat. No. 4,499,601. This application Feb. 8, 1985, Ser. No. 699,844
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] H03J *7/18*; H04B *1/16*
U.S. Cl. 455—166 **31 Claims**



1. A method of detecting and playing desired audio programs over a broadcast receiver which may be selectively tuned to receive broadcast signals from any one of a plurality of different broadcast stations comprising:
inputting from an external source a plurality of representations each representing a desired audio segment,
storing said representations,
scanning the audio programs being broadcast over the receiver by a plurality of different broadcast stations,
generating in response to said scanning step representations each representing a first portion of at least one of said audio programs, each audio program further comprising a remaining portion,
comparing said stored representations with said generated representations, and
playing a remaining portion of a desired audio program over the broadcast receiver when said comparing step determines a match between the stored representation of a desired audio segment and a generated representation of said at least one audio program.

290,900
SANDAL
Michael M. Schornstein, Memphis, Tenn., and Malcolm G. Blissett, Grand Rapids, Mich., assignors to Scholl, Inc., Memphis, Tenn.
Filed May 17, 1985, Ser. No. 722,252
Term of patent 14 years
U.S. Cl. D2—293

290,901
SHOE UPPER
James K. Tong, Beaverton, Oreg., and Robert L. Peterson, Taichung, Taiwan, assignors to Pensa, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 899,124
Term of patent 14 years
U.S. Cl. D2—314

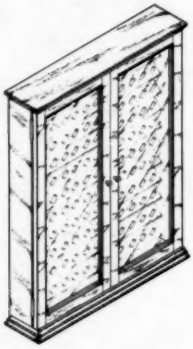
290,902
SHOE SOLE
Brenda Kelley, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 899,123
Term of patent 14 years
U.S. Cl. D2—320

290,903
SHOE SOLE
Masanobu Inohara, and Yoshiaki Hase, both of Akashi, Japan, assignors to Asics Corporation, Japan
Filed Apr. 12, 1985, Ser. No. 722,736
Claims priority, application Japan, Jan. 17, 1985, 60-1297
Term of patent 14 years
U.S. Cl. D2—320

290,904
DICKEY
Edward M. Crouch, 25 Regency Crescent, Whitby, Ontario, Canada L1N 7K8
Continuation of Ser. No. 427,485, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 143,303, Apr. 24, 1980. This application Feb. 2, 1984, Ser. No. 576,351
Term of patent 14 years
U.S. Cl. D2—602

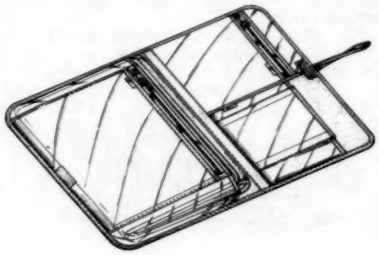
290,905
UMBRELLA HANDLE
Julie A. Selig, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Nov. 2, 1984, Ser. No. 667,597
Term of patent 14 years
U.S. Cl. D3—16

290,906
CABINET FOR SPOOLS OF SEWING THREAD OR THE LIKE
John S. Lux, 5825 North Haven Dr., North Highlands, Calif. 95660
Filed Jan. 22, 1985, Ser. No. 693,562
Term of patent 14 years
U.S. Cl. D3—25



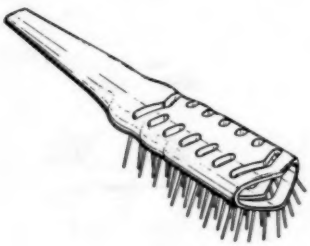
290,907
GUN RACK
Charles B. King, 5302 Blakeford Ct., Bethesda, Md. 20816
Filed Sep. 12, 1984, Ser. No. 649,727
Term of patent 14 years
U.S. Cl. D3—38

290,908
COMBINED CARRYING BAG FOR INFANT ACCESSORIES AND CHANGING MAT
Suzanne Thomas, New York, N.Y., assignor to Accessories by Us, Inc., New York, N.Y.
Filed Jul. 25, 1985, Ser. No. 758,996
Term of patent 14 years
U.S. Cl. D3—71



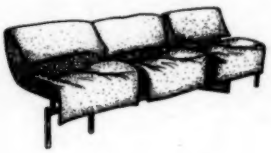
290,909
FOUNTAIN BRUSH
Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Austria, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Dec. 17, 1984, Ser. No. 682,066
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 14638403
The portion of the term of this patent subsequent to Jul. 28, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—115

290,910
HAIRBRUSH
Alan E. Steadman, Altrincham, and Christopher A. Burridge, Surbiton, both of England, assignors to Denroy Plastics Limited, Bangor, Northern Ireland
Filed Nov. 19, 1984, Ser. No. 674,283
Claims priority, application United Kingdom, May 19, 1984, 1019849
Term of patent 14 years
U.S. Cl. D4—136



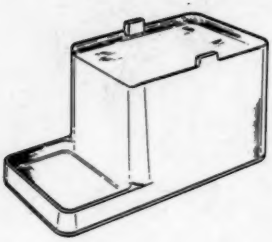
290,911
GLIDER SEAT
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Aug. 10, 1984, Ser. No. 639,597
Term of patent 14 years
U.S. Cl. D6—347

290,912
ADJUSTABLE SOFA
Rodrigo Rodriquez, Carimate, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Jan. 10, 1985, Ser. No. 690,150
Claims priority, application Italy, Jul. 11, 1984, 22542/84[U]
Term of patent 14 years
U.S. Cl. D6—367



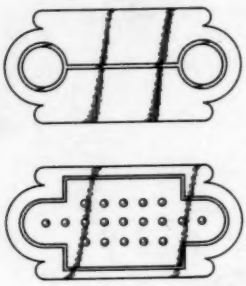
290,913
COMBINED ADJUSTABLE TABLE AND EXTENDIBLE SHELF UNIT
Kemper H. Righter, 2802 Lynn St., Bellingham, Wash. 98225
Filed Jan. 22, 1985, Ser. No. 693,597
Term of patent 14 years
U.S. Cl. D6—430

290,914
BEVERAGE SERVING STAND
Arthur R. Carlson, Melbourne, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Aug. 31, 1984, Ser. No. 646,568
Term of patent 14 years
U.S. Cl. D6—474



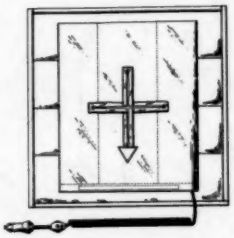
290,915
WORK TABLE FOR A KNITTING MACHINE OR THE LIKE
Thomas W. Hoover, 913 Rosewood La., Arlington, Tex. 76010
Filed Mar. 11, 1985, Ser. No. 710,471
Term of patent 14 years
U.S. Cl. D6—477

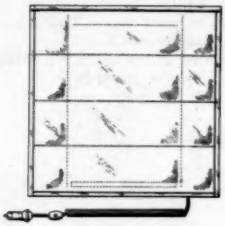
290,916
BATHTUB MAT
Debbie A. Madison, and Michael G. Madison, both of 34960 Judy La., Cathedral City, Calif. 92234
Filed Feb. 21, 1985, Ser. No. 704,043
Term of patent 14 years
U.S. Cl. D6—583

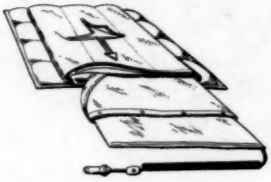


290,917
BEAR SLEEPING BAG AND RUG
Kenneth S. Rollins, Jr., 503 S. Hughes Blvd., Elizabeth City, N.C. 27909
Filed Jan. 7, 1985, Ser. No. 689,532
Term of patent 14 years
U.S. Cl. D6—589

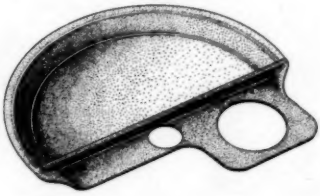
290,918
ELECTRICALLY HEATED COMFORTER OR THE LIKE
Joyce A. Ball, and Glen W. McKettrick, both of 7031 Mills Ave., Jacksonville, Fla. 32211
Filed Feb. 27, 1985, Ser. No. 706,176
Term of patent 14 years
U.S. Cl. D6—603





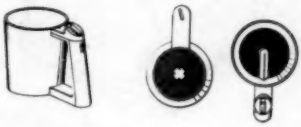


290,919
COMBINED HAND-HELD PLATE AND BEVERAGE HOLDER
William M. Beute, 132 Mt. Airy Rd., Bernardsville, N.J. 07924
Filed Apr. 26, 1985, Ser. No. 727,784
Term of patent 14 years
U.S. Cl. D7—38



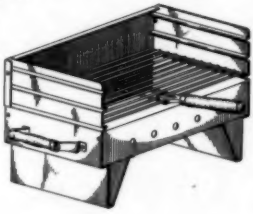
290,920
ICE CREAM SANDWICH MAKER OR THE LIKE
John V. Zaruba, Chicago, Ill.; Rino Conti, Stoughton, Mass., and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 1, 1985, Ser. No. 697,327
Term of patent 14 years
U.S. Cl. D7—43

290,921
BATTERY POWERED FLOUR SIFTER
Jamshid Dardashti, Los Angeles, Calif., assignor to J & F Import-Export International, Inc., Los Angeles, Calif.
Filed Jul. 12, 1984, Ser. No. 630,318
Term of patent 14 years
U.S. Cl. D7—47

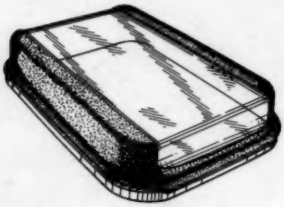


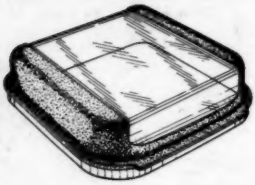
290,922
BEVERAGE CAN HOLDER
Freddy Herrera, 2410 Hackett #126, Houston, Tex. 77008
Filed May 3, 1985, Ser. No. 732,247
Term of patent 14 years
U.S. Cl. D7—70

290,923
BARBEQUE GRILL
Fredrick J. Erickson, Des Moines, Iowa, assignor to Ehco, Inc., Marshalltown, Iowa
Filed Sep. 23, 1985, Ser. No. 778,805
Term of patent 14 years
U.S. Cl. D7—337



290,924
COVER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,467
Term of patent 14 years
U.S. Cl. D7—391

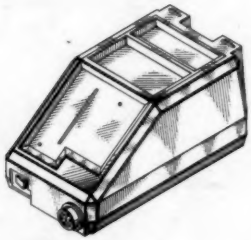




290,925
SHANK FOR A GARDEN SHEAR
Alan K. Pittaway, High Wycombe, England, and Christopher R. B. Harrison, Mid-Glamorgan, Wales, assignors to Wilkinson Sword Limited, High Wycombe, England
Filed Nov. 28, 1984, Ser. No. 675,490
Term of patent 14 years
U.S. Cl. D8—5

290,926
PLYWOOD CARRIER
Maurice C. Embra, 1834 West 1st Avenue, Vancouver, British Columbia, Canada V6J 1G5
Filed May 30, 1984, Ser. No. 615,377
Term of patent 14 years
U.S. Cl. D8—14

290,927
SOLDERING STATION
David A. Pagani, Newport Beach, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Dec. 18, 1984, Ser. No. 683,019
Term of patent 14 years
U.S. Cl. D8—30



290,928
SLIDEABLE, RESILIENT GUIDE BLOCK FOR WINDOWS
Einar Strandengen, Oslo, Norway, assignor to A/S Grorud Jernvarefabrik, Oslo, Norway
Filed Aug. 23, 1985, Ser. No. 768,591
Claims priority, application Norway, Mar. 20, 1985, 66114
Term of patent 14 years
U.S. Cl. D8—349

290,929

PRINTED CIRCUIT BOARD STAND-OFF

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

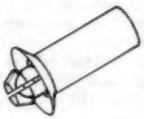
Filed Feb. 27, 1985, Ser. No. 706,462
Term of patent 14 years
U.S. Cl. D8—354

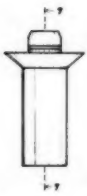
290,930

CIRCUIT BOARD SUPPORT

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

Filed May 15, 1985, Ser. No. 734,154
Term of patent 14 years
U.S. Cl. D8—354



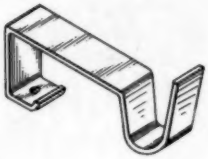


290,931

LADDER HOOK BRACKET

Jerald C. Powell, 120 E. Winters Dr., Colorado Springs, Colo. 80907

Filed Aug. 14, 1984, Ser. No. 640,732
Term of patent 14 years
U.S. Cl. D8—373



290,932

CONVEYOR CHAIN LINK

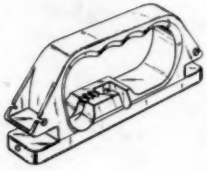
Goran Abbestam, Gothenburg, and Leif Lachonius, Surte, both of Sweden, assignors to Aktiebolaget SKF, Gothenburg, Sweden

Filed Oct. 10, 1984, Ser. No. 659,372
Claims priority, application Sweden, Apr. 10, 1984, 841176
Term of patent 14 years
U.S. Cl. D8—499

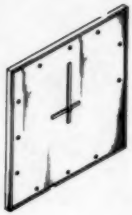
290,933
BOTTLE
William S. Maginnis, Jr., Fullerton, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.
Filed Sep. 13, 1984, Ser. No. 650,115
Term of patent 14 years
U.S. Cl. D9—385

290,934
BOTTLE
Vernon C. Rader, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 564,945, Dec. 23, 1983. This application Apr. 24, 1986, Ser. No. 857,570
Term of patent 14 years
U.S. Cl. D9—413

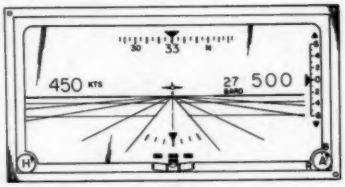
290,935
HANDLE FOR PACKAGES OR THE LIKE
Charles G. D. Williams, 31 Harbor Sight Dr., Rolling Hills Estates, Calif. 90274
Filed Jul. 15, 1985, Ser. No. 755,156
Term of patent 14 years
U.S. Cl. D9—434



290,936
CLOCK DESIGN
Michael W. Hill, 1116 W. Main St., Marshalltown, Iowa 50158
Filed Jun. 18, 1984, Ser. No. 621,620
Term of patent 14 years
U.S. Cl. D10—25



290,937
AIRCRAFT FLIGHT INSTRUMENT
Vincent A. Devino, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Oct. 15, 1984, Ser. No. 660,636
Term of patent 14 years
U.S. Cl. D10—67



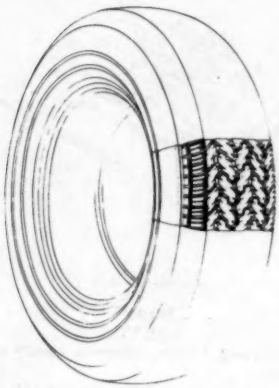
290,938
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 12, 1985, Ser. No. 722,451
Claims priority, application Italy, Oct. 12, 1984, 36149/84[U]
Term of patent 14 years
U.S. Cl. D11—3

290,939
JEWELRY PENDANT OR THE LIKE
Kurt J. Lerner, P.O. Box 396, Murphy, N.C. 28906
Filed Jul. 16, 1985, Ser. No. 755,351
Term of patent 14 years
U.S. Cl. D11—81

290,940
KNOCK-DOWN TRICYCLE
Stephen W. Smith, Bedford, Pa., and William H. Ziegler, Jr., Opelika, Ala., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.
Filed Aug. 12, 1985, Ser. No. 764,535
Term of patent 14 years
U.S. Cl. D12—113

290,941
AUTOMOBILE TIRE
Hideki Matsuda, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed May 30, 1984, Ser. No. 615,199
Claims priority, application Japan, Nov. 30, 1983, 58-51626
Term of patent 14 years
U.S. Cl. D12—142

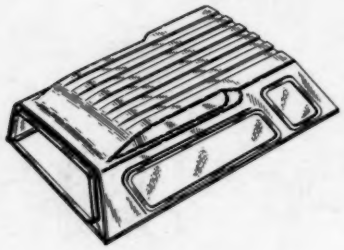
290,942
TIRE
Ronald L. Messer, Simpsonville, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland
Filed Oct. 29, 1985, Ser. No. 792,481
Term of patent 14 years
U.S. Cl. D12—147



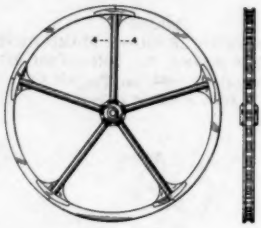
290,943
COVER FOR A VEHICLE BRAKE FLUID RESERVOIR
Daniel L. Irby, 5678 Berkeley Rd., Goleta, Calif. 93117
Filed Jul. 12, 1984, Ser. No. 630,101
Term of patent 14 years
U.S. Cl. D12—155

290,944
COVER FOR A VEHICLE BRAKE FLUID RESERVOIR
Daniel L. Irby, 5678 Berkeley Rd., Goleta, Calif. 93117
Filed Jul. 12, 1984, Ser. No. 630,104
Term of patent 14 years
U.S. Cl. D12—155

290,945
PICKUP CANOPY
Henry O. Geisler, Boring, Oreg., assignor to Gem Top Mfg. Inc., Clackamas, Oreg.
Filed May 28, 1985, Ser. No. 738,298
Term of patent 14 years
U.S. Cl. D12—156

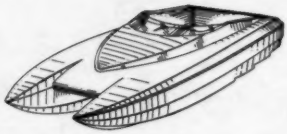


290,946
WHEEL
Ulf Bruder, Göteborg, Sweden, assignor to Innofibre AB, Göteborg, Sweden
Filed Jul. 26, 1984, Ser. No. 634,627
Claims priority, application Sweden, Jan. 26, 1984, 84-0236
Term of patent 14 years
U.S. Cl. D12—205



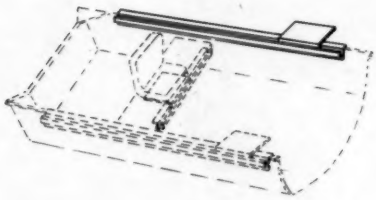
290,947
ANCHOR
Rocco D. Albertini, Media; Arthur W. McClellan, Aston; Stephen A. Kokoszka, Chester, and Patrick C. Girten, Media, all of Pa., assignors to Baldt Incorporated, Chester, Pa.
Filed Mar. 18, 1985, Ser. No. 712,700
Term of patent 14 years
U.S. Cl. D12—215

290,948
CATAMARAN TYPE BOAT
Peter C. Hledin, 3530 Burton Ridge, Apt. K, Grand Rapids, Mich. 49506
Filed Jan. 31, 1985, Ser. No. 696,781
Term of patent 14 years
U.S. Cl. D12—310



290,949
CRUISING YACHT
Clark T. Scarboro, Lake Stevens, Wash., assignor to Bayliner Marine Corporation, Seattle, Wash.
Filed Nov. 13, 1985, Ser. No. 805,000
Term of patent 14 years
U.S. Cl. D12—315

290,950
BOAT ACCESSORY EXTRUSION
Allen Strickland, P.O. Box 612, Blackshear, Ga. 31516
Filed Jun. 15, 1984, Ser. No. 620,857
Term of patent 14 years
U.S. Cl. D12—317



290,951

ULTRALIGHT AIRCRAFT

Francis J. Hanback, 15 Clipper Rd, Abalone Cove, Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 539,003, Oct. 4, 1983, abandoned. This application Sep. 4, 1985, Ser. No. 772,433

Term of patent 14 years

U.S. Cl. D12—322

290,952

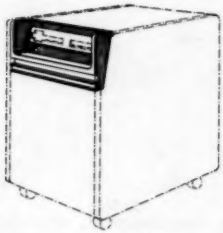
PANEL FOR PHOTOTYPESETTER OR THE LIKE

John Price, Peabody, Mass., assignor to Xyvision, Inc., Woburn, Mass.

Filed May 18, 1984, Ser. No. 612,046

Term of patent 14 years

U.S. Cl. D13—35



290,953

SPEAKER ENCLOSURE

Michael E. Sklaar, White Birch Rd., R.D. 2, Box 377, Putnam Valley, N.Y. 10579, and Michael Z. Berkowicz, 110 Caterson Ter., Hartsdale, N.Y. 10530

Filed Nov. 13, 1984, Ser. No. 670,684

Term of patent 14 years

U.S. Cl. D14—33

290,954

HOUSING FOR CREDIT CARD PAYMENT TELEPHONE

Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 5, 1985, Ser. No. 752,890

Term of patent 14 years

U.S. Cl. D14—61

290,955

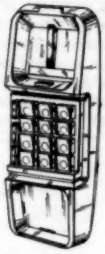
TELEPHONE STAND FOR A HANDSET TRANSCEIVER

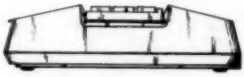
James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.

Filed Aug. 23, 1985, Ser. No. 768,632

Term of patent 14 years

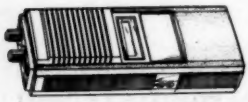
U.S. Cl. D14—62





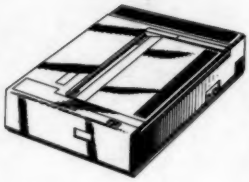
290,956
COMBINED SHOULDER REST FOR A TELEPHONE HANDSET AND AN ADAPTER THEREFOR
Frederick G. Witham, 12022 NE. Fremont St., Portland, Oreg. 97220
Filed Apr. 29, 1985, Ser. No. 728,252
Term of patent 14 years
U.S. Cl. D14—65

290,957
HAND-HELD SCANNING RECEIVER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Oct. 23, 1984, Ser. No. 664,060
Term of patent 14 years
U.S. Cl. D14—68

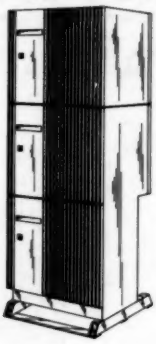


290,958
COMBINED TELEPHONE, CLOCK, RADIO AND TELEVISION RECEIVER
Yoshiaki Kawata, Hyogo; Masaki Yamamoto, Nara; Toyoyuki Uematsu, Osaka; Hiroyuki Tsubaki, Osaka, and Yutaka Itoh, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 13, 1984, Ser. No. 670,849
Claims priority, application Japan, May 15, 1984, 59-19594
Term of patent 14 years
U.S. Cl. D14—79

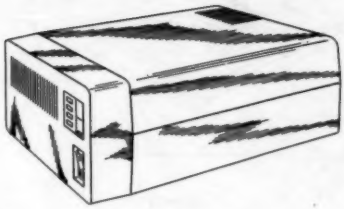
290,959
FACSIMILE MACHINE
Yoshihisa Oole, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 11, 1985, Ser. No. 690,687
Claims priority, application Japan, Jul. 12, 1984, 59-29329
Term of patent 14 years
U.S. Cl. D14—94



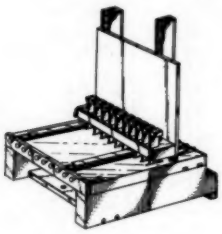
290,960
CABINET FOR PROCESS DATA ACQUISITION AND CONTROL EQUIPMENT
James E. Brann, Davie, Fla., assignor to Autech Partners Ltd., Pompano Beach, Fla.
Filed Nov. 15, 1984, Ser. No. 671,735
Term of patent 14 years
U.S. Cl. D14—102



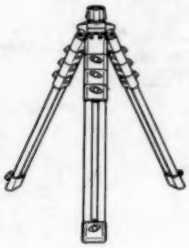
290,961
WORK-STATION CONTROLLER
Peter J. Mendel, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 569,090, Jan. 9, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 935,157
Term of patent 14 years
U.S. Cl. D14—107



290,962
ELECTRONIC COMPONENT VERTICAL STACK FEED APPARATUS FOR USE IN PRINTED CIRCUIT ASSEMBLY MACHINES
David R. Harding, Ojai, Calif., assignor to Micro Component Technology, Inc., St.Paul, Minn.
Filed Jan. 24, 1984, Ser. No. 573,386
Term of patent 14 years
U.S. Cl. D15—199

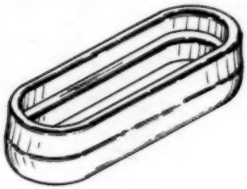


290,963
TRIPOD
Dieter Groschupp, Weiherweg 2, D-8506 Langenzenn, Fed. Rep. of Germany
Filed Apr. 5, 1985, Ser. No. 720,091
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, MR 8102
Term of patent 14 years
U.S. Cl. D16—45

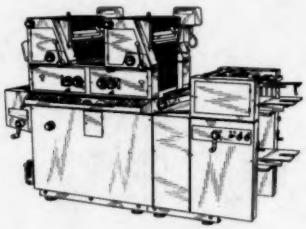


290,964
EYEGLASS SIDE GUARD
Edward V. L. Kalbach, 575 W. 3200 South, Nibley, Utah 84321
Filed May 20, 1985, Ser. No. 735,632
Term of patent 14 years
U.S. Cl. D16—123

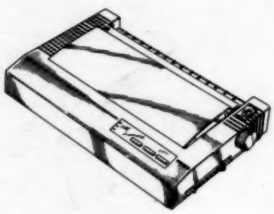
290,965
PISTON VALVE ASSEMBLY OIL SHIELD
Stuart L. Satalof, Las Vegas, Nev., and Steven I. Weiner, 3080 Garnet Ct., Las Vegas, Nev. 89121, assignors to Steven I. Weiner, Las Vegas, Nev.
Filed May 4, 1984, Ser. No. 607,177
Term of patent 14 years
U.S. Cl. D17—13



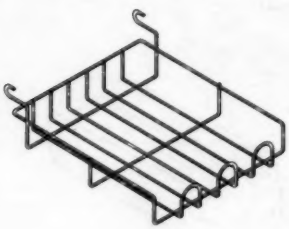
290,966
PRINTING MACHINE
Toshiaki Saito; Koji Ishii, and Tetsuyuki Doi, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jul. 17, 1985, Ser. No. 755,991
Claims priority, application Japan, Jan. 23, 1985, 60-2139
Term of patent 14 years
U.S. Cl. D18—13



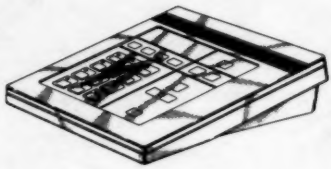
290,967
PRINTER
Nobutoshi Mochizuki, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1985, Ser. No. 805,550
Claims priority, application Japan, Jul. 22, 1985, 60-31005
Term of patent 14 years
U.S. Cl. D18—13



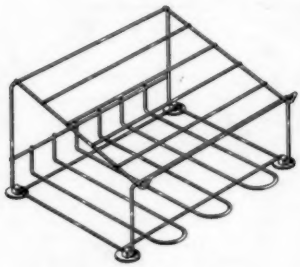
290,968
RECEIVING TRAY FOR A PRINTER
Beverly C. Rich, 111 W. Timonium Rd., Timonium, Md. 21093
Filed Apr. 1, 1985, Ser. No. 718,474
Term of patent 14 years
U.S. Cl. D18—22



290,969
REMOTE CONTROLLER FOR A PRINTER
Masatoki Sutou, Okazaki; Jun Nishiseko; Takako Onishi, both of Toyokawa; Seiichi Yamagishi, Machida, all of Japan; Walter F. Anderson, Jr., Minneapolis, and Brian D. Sabo, Rosemount, both of Minn., assignors to Minolta Camera K.K., Osaka, Japan and Minnesota Mining & Manufacturing Co., St. Paul, Minn.
Filed May 22, 1985, Ser. No. 736,716
Claims priority, application Japan, Nov. 22, 1984, 59-48256
Term of patent 14 years
U.S. Cl. D18—22



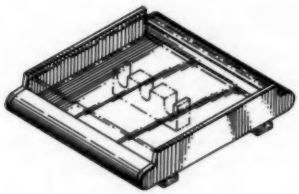
290,970
PRINTER STAND
Beverly C. Rich, 111 W. Timonium Rd., Timonium, Md. 21093
Filed Apr. 1, 1985, Ser. No. 718,476
Term of patent 14 years
U.S. Cl. D18—23



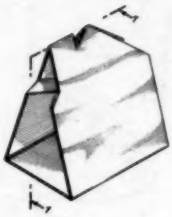
290,971
MUSICAL CLEF PAPER CLIP
Tom Quilty, 8985 Riderwood Dr., Sunland, Calif. 91040
Filed Dec. 3, 1984, Ser. No. 677,743
Term of patent 14 years
U.S. Cl. D19—65

290,972
MAGNETIC HOLDER FOR A PIECE OF PAPER
Kenji Irie, Osaka, Japan, assignor to Irie Co., Ltd., Osaka, Japan
Filed Jul. 11, 1984, Ser. No. 629,598
Term of patent 14 years
U.S. Cl. D19—90

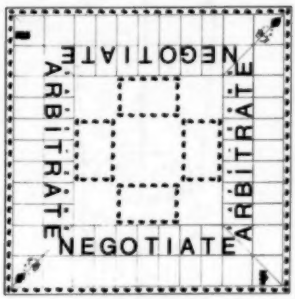
290,973
DESK CONSOLE ELEMENT
Robert A. O'Neil, West Chicago, Ill., assignor to McDonald Products Corporation, Buffalo, N.Y.
Filed May 21, 1984, Ser. No. 612,460
Term of patent 14 years
U.S. Cl. D19—92



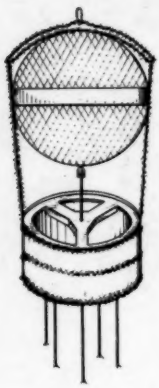
290,974
SIGN
Roger Butcher, 5921 Petaluma Ct., Sacramento, Calif. 95841
Filed Oct. 15, 1985, Ser. No. 787,731
Term of patent 14 years
U.S. Cl. D20—38



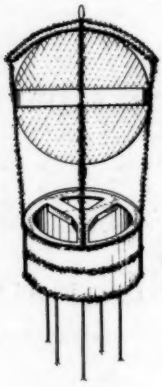
290,975
GAME BOARD
Christine Mahoney, Houston, Tex., assignor to Labor-Management Publications, Inc., Lansing, Mich.
Filed Apr. 8, 1985, Ser. No. 720,982
Term of patent 14 years
U.S. Cl. D21—25



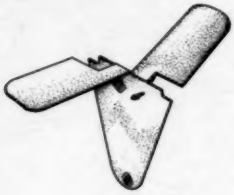
290,976
FESTOONED PINATA
Ricardo Bajo, 1607 89th St., North Bergen, N.J. 07047
Filed Aug. 16, 1984, Ser. No. 641,433
The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—59



290,977
FESTOONED PINATA
Ricardo Bajo, 1607 89th St., North Bergen, N.J. 07047
Filed Aug. 16, 1984, Ser. No. 641,447
The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—59



290,978
FLYING TOY
James L. Capo, and Carl L. Capo, both of 4902 Brookhaven Dr., Middletown, Ohio 45044
Filed Mar. 11, 1985, Ser. No. 710,778
Term of patent 14 years
U.S. Cl. D21—82



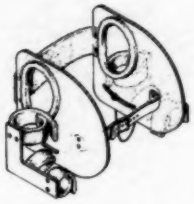
290,979
TOY COW
Akito Sato, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Nagoya, Japan
Filed Aug. 2, 1984, Ser. No. 637,247
Term of patent 14 years
U.S. Cl. D21—148

290,980
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jan. 16, 1985, Ser. No. 691,955
Term of patent 14 years
U.S. Cl. D21—159

290,981
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jan. 16, 1985, Ser. No. 691,956
Term of patent 14 years
U.S. Cl. D21—159

290,982
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Michael J. Spindle, Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jan. 16, 1985, Ser. No. 691,957
Term of patent 14 years
U.S. Cl. D21—159

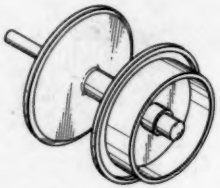
290,983
TRAINING HARNESS FOR TRACK AND FIELD ATHLETES
Mark L. Taylor, 5120 Pomegranate Ave., Sacramento, Calif. 95823
Filed May 20, 1985, Ser. No. 735,909
Term of patent 14 years
U.S. Cl. D21—191



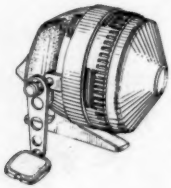
290,984
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,533
Term of patent 14 years
U.S. Cl. D21—219

290,985
GOLF TOOL
Joseph K. Dikoff, P.O. Box 4553, Christiansted, St. Croix, V.I. 00820
Filed Jan. 28, 1985, Ser. No. 695,305
Term of patent 14 years
U.S. Cl. D21—234

290,986
FISHING REEL SPOOL
Kaname Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 28, 1984, Ser. No. 687,398
Claims priority, application Japan, Jul. 4, 1984, 59-27626
Term of patent 14 years
U.S. Cl. D22—137

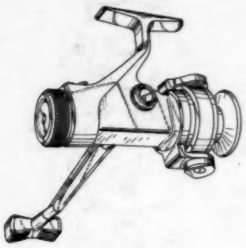


290,987
SPIN CAST FISHING REEL
Richard J. Robbins, Derby, Kans., and Roy Stiner, Tulsa, Okla., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jul. 20, 1984, Ser. No. 633,018
Term of patent 14 years
U.S. Cl. D22—141

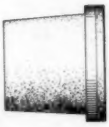


290,988
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 7, 1984, Ser. No. 668,954
Claims priority, application Japan, May 24, 1984, 59-21287
Term of patent 14 years
U.S. Cl. D22—141

290,989
SPINNING FISHING REEL
Richard E. Ten Eyck, and Gary P. Israel, both of Wichita, Kans., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jun. 15, 1984, Ser. No. 621,227
Term of patent 14 years
U.S. Cl. D22—141



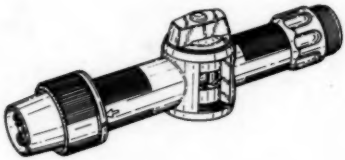
290,990
INSULATED COVER FOR A FAUCET OR THE LIKE
Lewis B. Izzi, Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.
Filed Mar. 27, 1985, Ser. No. 716,555
Term of patent 14 years
U.S. Cl. D23—1



290,991
FAUCET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Dec. 27, 1985, Ser. No. 813,770
Term of patent 14 years
U.S. Cl. D23—25

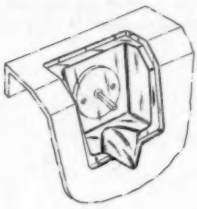
290,992
FAUCET SPOUT
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Dec. 2, 1985, Ser. No. 803,721
Term of patent 14 years
U.S. Cl. D23—32

290,993
SPRAY NOZZLE
Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH & Co. KG, Fed. Rep. of Germany
Filed Dec. 17, 1984, Ser. No. 682,063
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, GRAIII14638403
Term of patent 14 years
U.S. Cl. D23—35

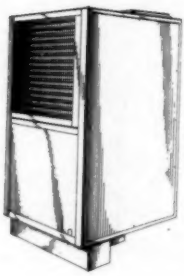


290,994
WATER CLOSET
Jacques P. Hardion, Selles-sur-Cher, France, assignor to Produits Ceramiques de Touraine, Selles-sur-Cher, France
Filed Jan. 17, 1984, Ser. No. 571,531
Claims priority, application France, Sep. 30, 1983, 833556
Term of patent 14 years
U.S. Cl. D23—65

290,995
OVERFLOW CAVITY AND COVER FOR BATHTUB
Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604
Filed Jan. 20, 1984, Ser. No. 572,626
Term of patent 14 years
U.S. Cl. D23—69

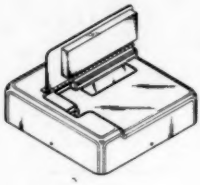


290,996
COMPACT HEAT EXCHANGER
Grady A. Bingham, Morehead City, N.C., assignor to Thermal Concepts, Inc.
Filed Oct. 24, 1984, Ser. No. 664,357
Term of patent 14 years
U.S. Cl. D23—136



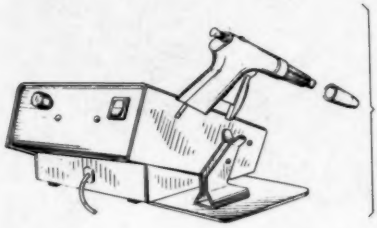
290,997
ELECTRIC FAN
Toshiyuki Utsuki, Tachikawa; Shuichi Kouno, Tokorozawa; Kazunori Yanagisawa, Yamato, and Yasuo Tsumurai, Higashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 26, 1985, Ser. No. 813,631
Claims priority, application Japan, Oct. 21, 1985, 60-43826
Term of patent 14 years
U.S. Cl. D23—155

290,998
PORTABLE X-RAY FILM PRINTER FOR IMPRINTING PATIENT INFORMATION OR THE LIKE ON UNEXPOSED PORTION OF X-RAY FILM
Roderique S. Gemmill, Davie, Fla., assignor to Radiation Concepts, Inc., Davie, Fla.
Filed Feb. 19, 1985, Ser. No. 703,115
Term of patent 14 years
U.S. Cl. D24—2

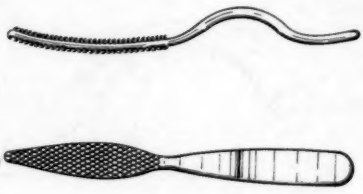


290,999
VIAL
Robert M. Novak, Baltimore, Md., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Oct. 20, 1983, Ser. No. 543,679
Term of patent 14 years
U.S. Cl. D24—8

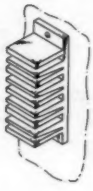
291,000
COMBINED INJECTOR GUN, CAP, AND POWER UNIT FOR DENTAL TREATMENT
Michael J. Botich, Montclair, Calif., assignor to Unitek Corporation, Monrovia, Calif.
Filed Mar. 8, 1984, Ser. No. 587,338
Term of patent 14 years
U.S. Cl. D24—10



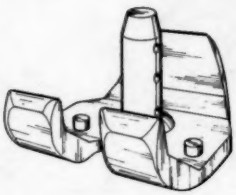
291,001
TONGUE SCRAPER
Jean Gaskins, 11416 Nairn Rd., Wheaton, Md. 20902
Filed Nov. 22, 1985, Ser. No. 806,216
Term of patent 14 years
U.S. Cl. D24—10



291,002
DENTAL TRAY RACK
James B. Zimmerman, 11 Lakeshore Plz., Kirkland, Wash. 98033
Division of Ser. No. 496,928, May 23, 1983, Pat. No. D. 285,254.
This application Feb. 25, 1986, Ser. No. 836,459
Term of patent 14 years
U.S. Cl. D24—31

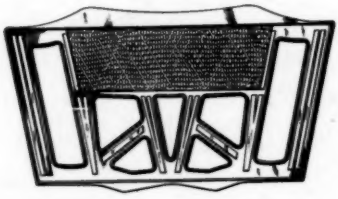


291,003
KNEE PROSTHESIS
Ronald L. Huckstep, 108 Sugarloaf Cresc., Castlecrag, N.S.W., Australia 2068
Filed Jul. 23, 1984, Ser. No. 633,630
Claims priority, application Australia, Feb. 3, 1984, 6411/84
Term of patent 14 years
U.S. Cl. D24—33



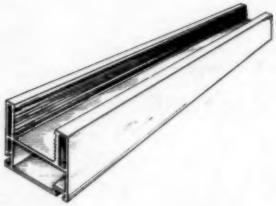
291,004
POOLING CONTAINER FOR PARENTERAL FLUIDS AND THE LIKE
Michael R. Keilman, Mundelein, and Richard L. West, Ingleside, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Sep. 21, 1983, Ser. No. 534,474
Term of patent 14 years
U.S. Cl. D24—56

291,005
KIDNEY BELT PAD
Remo Berlese, 31036 Ospedaletto di Istrana ViaCastellana 90 Zona Ind., Treviso, Italy
Filed Sep. 21, 1984, Ser. No. 653,952
Term of patent 14 years
U.S. Cl. D24—64

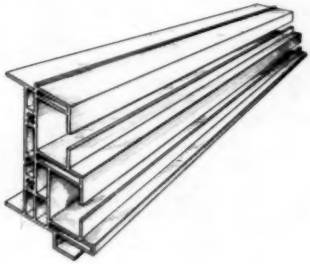


291,006
EXTRUSION FOR LADDER STEP
Ronald A. Minichillo, and Wayne R. Broyles, both of Elkhart, Ind., assignors to Kemberly, Inc., Elkhart, Ind.
Filed Oct. 15, 1984, Ser. No. 662,237
Term of patent 14 years
U.S. Cl. D25—69

291,007
WINDOW COMPONENT EXTRUSION
Ludwig Reisinger, McPherson, and Dennis Westphal, Galva, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Oct. 24, 1984, Ser. No. 664,385
Term of patent 14 years
U.S. Cl. D25—74

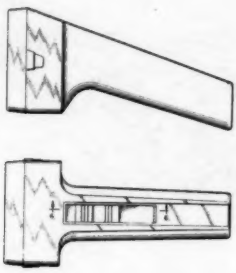


291,008
WINDOW COMPONENT EXTRUSION
Ludwig Reisinger, McPherson, and Dennis Westphal, Galva, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Oct. 23, 1984, Ser. No. 664,403
Term of patent 14 years
U.S. Cl. D25—74



291,009
EXTRUSION
Gerth Weilow, Bergsättravägen 3, 151 49 Södertälje, Sweden
Filed Oct. 16, 1984, Ser. No. 661,358
Claims priority, application Sweden, Apr. 17, 1984, 84-1276
Term of patent 14 years
U.S. Cl. D25—75

291,010
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed May 23, 1984, Ser. No. 613,322
Term of patent 14 years
U.S. Cl. D26—46

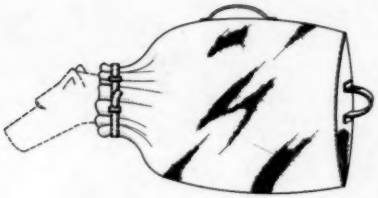


291,011
CAMPING LIGHT STANDARD
William C. Fleming, 1440 Cheswick Pl., Westlake Village, Calif. 91361
Filed Aug. 15, 1985, Ser. No. 765,645
Term of patent 14 years
U.S. Cl. D26—138

291,012
LAMP
Lars Liljeqvist, Olaigatan 13 A, S-703 61 Örebro, Sweden
Filed Jun. 15, 1984, Ser. No. 620,933
Claims priority, application Sweden, Dec. 16, 1983, 83-3350
Term of patent 14 years
U.S. Cl. D26—104

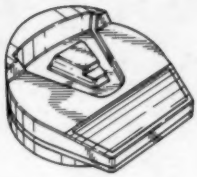
291,013
COMBINED DISPOSABLE RAZOR AND SHAVING CREAM CONTAINER
Marvin W. Plummer, 230 Midway Ave., Madisonville, Ky. 42431
Filed Aug. 7, 1985, Ser. No. 763,286
Term of patent 14 years
U.S. Cl. D28—46

291,014
PET ENCLOSURE BAG FOR PEST ERADICATION, TRANSPORTATION AND SECURITY
Matthew W. Grum, 39 Blanche Ct., New Monmouth, N.J. 07748
Filed Nov. 22, 1985, Ser. No. 806,181
Term of patent 14 years
U.S. Cl. D30—1



291,015
HORSE MUZZLE
Derald R. Torrens, and Joann Torrens, both of 8726 LaFayette Ave., Omaha, Nebr. 68114
Continuation-in-part of Ser. No. 583,632, Feb. 27, 1984, abandoned. This application Sep. 17, 1984, Ser. No. 651,347
Term of patent 14 years
U.S. Cl. D30—33

291,016
BASE FOR AN APPLIANCE SUCH AS AN IRON
Ronald E. Babros, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Oct. 16, 1985, Ser. No. 787,885
Term of patent 14 years
U.S. Cl. D32—73



291,017
TRAILER STAND
Ronald Magness, Rte. 2, Box 26F, Flint, Tex. 75762
Filed Jun. 18, 1984, Ser. No. 622,013
Term of patent 14 years
U.S. Cl. D34—31

291,018

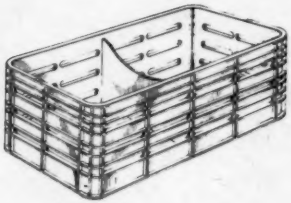
CITRUS CRATE

Kornel Lates, Thornhill, Canada, assignor to Scepter Manufacturing Co. Ltd., Toronto, Canada

Filed Dec. 5, 1984, Ser. No. 678,250

Term of patent 14 years

U.S. Cl. D34—46



291,019

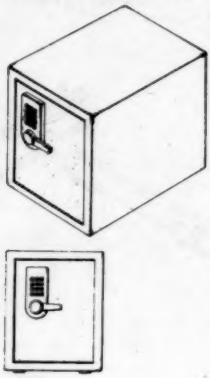
SAFE

Harold N. Druibet, 1033 Naranca Ave., El Cajon, Calif. 92021

Filed Nov. 16, 1984, Ser. No. 672,183

Term of patent 14 years

U.S. Cl. D99—28



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TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/G Technology Corporation: *See*—
Gollan, Arye Z., 4,681,605, Cl. 55-158.000.

A. Nattermann & Cie, GmbH: *See*—
Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Olson, George E., 4,680,980, Cl. 74-125.000.

A-1 Security Manufacturing Corp.: *See*—
Detloff, John C., 4,680,860, Cl. 29-804.000.

A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbh Prof. Dr.Dr. h.c. Hans List: *See*—
Schukoff, Bruno, 4,681,080, Cl. 123-506.000.

Aarts, Petrus J. J.; and Huber, Alois, to U.S. Philips Corporation. Recording and/or reproducing apparatus. 4,681,281, Cl. 242-200.000.

AB Betjanten: *See*—
Olofsson, Lars; and Hospers, Martin, 4,681,241, Cl. 221-124.000.

Abbott Laboratories: *See*—
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., 4,681,872, Cl. 514-29.000.

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Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

Abe, Hitoshi: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.

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Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.

Abe, Takao: *See*—
Maehashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.

Abiru, Norifumi: *See*—
Ohdai, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji, 4,680,950, Cl. 72-130.000.

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James, James R., 4,681,137, Cl. 137-568.000.

Achorn, G. Stanley: *See*—
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.

Acme Electric Corporation: *See*—
Monsell, Kurt, 4,682,262, Cl. 361-6.000.

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Pine, James J., 4,681,365, Cl. 297-85.000.

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Kubota, Naohiro; and Nishimura, Atsushi, 4,681,905, Cl. 524-91.000.

Adret Electronique: *See*—
Remy, Joel; and Charbonnier, Roger, 4,682,122, Cl. 331-2.000.

Advanced Micro Devices, Inc.: *See*—
Chu, John W.; and Bereznak, Bradley J., 4,682,143, Cl. 338-307.000.

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Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.

Agrozet, koncernovy podnik: *See*—
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Ahlers, Heinfried: *See*—
Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, 4,682,341, Cl. 373-99.000.

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Hirama, Shigemitsu; Aida, Satoru; and Soyama, Hideo, 4,680,919, Cl. 53-499.000.

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Dyer, Paul N.; Pierantozzi, Ronald; and Withers, Howard P., 4,681,867, Cl. 502-242.000.

Airpot Corporation: *See*—
Leonard, George H., 4,681,307, Cl. 267-154.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Tsuruta, Matsuhisa, 4,681,194, Cl. 188-71.900.

Akae, Yoshifumi: *See*—
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

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Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

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Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.

Akiyama, Susumu: *See*—
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Taki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.

Akzo NV: *See*—
Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.

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White, Harold R.; and Doncer, Alex J., 4,681,682, Cl. 210-221.200.

Albany International Corp.: *See*—
Donovan, James G.; and Skelton, John, 4,681,789, Cl. 428-93.000.

Albrecht, Gene A.: *See*—
Johnson, James S.; and Albrecht, Gene A., 4,680,866, Cl. 33-356.000.

Albrecht, Wilhelm: *See*—
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.

Alcan Aluminum Corporation: *See*—
Legg, Gene A., 4,680,851, Cl. 29-433.000.

Alcan International Limited: *See*—
Davies, Nigel C.; and Sheasby, Peter G., 4,681,668, Cl. 204-28.000.
Gnyra, Bohdan, 4,681,819, Cl. 428-697.000.

Alcatel N.V.: *See*—
Staub, Norbert, 4,682,073, Cl. 313-414.000.

Aleshire, Rex A.: *See*—
Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.

Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, to Eastman Kodak Company. Method of chemical electrographic image amplification using chemically active toner particles. 4,681,828, Cl. 430-97.000.

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Allied Corporation: *See*—
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Fulmer, Keith H.; Peebles, Arthur K.; and Steininger, Hugh D., 4,681,196, Cl. 192-3.00H.
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,681,792, Cl. 428-102.000.
Rupp, James W., 4,680,844, Cl. 29-156.40R.

Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.

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Alphatime Ltd: *See—*
Revici, Emanuel, 4,681,753, Cl. 424-10.000.

Aluminium Pechiney: *See—*
Guillermet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, 4,681,665, Cl. 204-14.100.

Aluminum Company of America: *See—*
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.

Aly, Abou: *See—*
Wieland, Dieter; Aly, Abou; and Riess, Hartmut, 4,680,862, Cl. 30-381.000.

Alyfuku, Kiyoshi: *See—*
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.

ALZA Corporation: *See—*
Gale, Robert M.; and Berggren, Randall G., 4,681,584, Cl. 604-897.000.
Urquhart, John; and Theeuwes, Felix, 4,681,583, Cl. 604-892.000.

Amada Company, Limited: *See—*
Sakamoto, Katsuyoshi, 4,680,955, Cl. 72-462.000.

Amann, Markus-Christian, to Siemens Aktiengesellschaft. Laser diode with buried active layer and lateral current limitation by use of a self-adjusted pn-junction. 4,682,337, Cl. 372-44.000.

Amazawa, Kiyoshi; and Mori, Akira, to Clarion Co., Ltd. Noise eliminating signal compensation circuit. 4,682,045, Cl. 307-125.000.

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Woffinden, Gary A.; and Hanson, Donald L., 4,682,281, Cl. 364-200.000.

Amerace Corporation: *See—*
Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., 4,682,153, Cl. 340-507.000.

American Davidson, Inc.: *See—*
Davis, Robert J., 4,681,509, Cl. 415-161.000.

American Hoechst Corporation: *See—*
Jester, Randy D., 4,681,723, Cl. 264-175.000.

American Home Products Corporation: *See—*
Guley, Paul C., 4,681,765, Cl. 424-456.000.
Musser, John H.; and Bender, Reinhold H. W., 4,681,940, Cl. 546-174.000.

American Hospital Supply Corporation: *See—*
Hanaway, Richard W., 4,681,741, Cl. 422-100.000.

American Medical and Emergency Research Corporation: *See—*
Rolnick, Michael A., 4,681,094, Cl. 128-10.000.

American Telephone and Telegraph Company: *See—*
Werner, Jean J., 4,682,358, Cl. 379-411.000.

American Telephone & Telegraph Co., AT&T Bell Lab.: *See—*
Schrofer, Eldred P., 4,682,284, Cl. 364-200.000.

American Telephone and Telegraph Company AT&T Bell Laboratories: *See—*
Bean, John C., 4,681,773, Cl. 427-38.000.
Gans, Michael J., 4,682,180, Cl. 343-769.000.

American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See—*
Harringer, Robert V.; Rada, Robert O.; and Vesely, Edward J., 4,681,208, Cl. 198-341.000.

Amiet, Pierre: *See—*
Beuneche, Daniel; Mauvieux, Christian; and Amiet, Pierre, 4,681,730, Cl. 376-252.000.

Amita, Kozo: *See—*
Kubota, Mitsuru; and Amita, Kozo, 4,682,170, Cl. 340-928.000.

Amity Leather Products Company: *See—*
Lund, Eric W.; and Young, Raymond W., 4,682,310, Cl. 368-278.000.

Amoco Corporation: *See—*
Crowley, Michael S., 4,680,908, Cl. 52-378.000.

Amory, Henri; and Prost, Jean-Michel, to Pathe Marconi EMI SA. Apparatus for the injection moulding of disc records. 4,681,527, Cl. 425-546.000.

AMP Incorporated: *See—*
Bhatt, Vipul, 4,681,397, Cl. 350-96.200.
Chang, Paul S.; and Dowling, Edward C., 4,682,168, Cl. 340-825.650.
Lockard, Joseph L., 4,681,382, Cl. 439-92.000.
Schriver, Harold S., Jr., 4,681,691, Cl. 252-12.000.
Somer, Gerald L., 4,682,344, Cl. 375-62.000.

Ampafrance, S.A.: *See—*
Pasquini, Henri, 4,681,340, Cl. 280-642.000.

Analog and Digital Systems, Inc.: *See—*
DeFreitas, Richard E.; and Sullivan, Daniel T., 4,682,362, Cl. 381-61.000.

Anderson, Arthur B.; and Brandt, Sherry L., to Procter & Gamble Company, The. Pantiliner with ventilation areas. 4,681,578, Cl. 604-385.00R.

Anderson, Francis J., to Anderson Research and Development Limited. Vibrating sensing device. 4,681,991, Cl. 200-61.45R.

Anderson Research and Development Limited: *See—*
Anderson, Francis J., 4,681,991, Cl. 200-61.45R.

Andersson, Denny. Ski holding device. 4,681,246, Cl. 224-267.000.

Ando, Mitosi: *See—*
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, to Nippondenso Co., Ltd. Color video display apparatus for vehicles. 4,682,228, Cl. 358-161.000.

Ando, Takao: *See—*
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Ando, Toshiharu: *See—*
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.

Andre, Guy; Gollin, Robert; and Daloia, Gaetan, to Raymond, A. Cable tie. 4,680,834, Cl. 24-16.0PB.

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Andre, Wolfram K.: *See—*
Wolf, Kurt; and Andre, Wolfram K., 4,682,012, Cl. 219-490.000.

Andreas Stihl: *See—*
Wieland, Dieter; Aly, Abou; and Riess, Hartmut, 4,680,862, Cl. 30-381.000.

Andreasson, Kurt. Method of documentating an inventory, and a sealing mechanism for use therewith. 4,682,249, Cl. 360-33.100.

Anflo, Kjell S.; and Grabs, Jan W. I., to U.S. Philips Corporation. HF arrangement. 4,682,178, Cl. 342-202.000.

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Eberl, Tertulin; and Weber-Unger, Georg, 4,681,587, Cl. 623-7.000.

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Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.

Anton Steinecker Maschinenfabrik GmbH: *See—*
Widhopf, Martin, 4,681,066, Cl. 122-234.000.

Aoi, Tatsuo: *See—*
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

Aoki Corporation: *See—*
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.

Aoki, Takashi: *See—*
Nishikawa, Masao; and Aoki, Takashi, 4,680,928, Cl. 60-329.000.

Aplex Corporation: *See—*
McGovern, Lore H.; and Moore, Alix A., 4,681,573, Cl. 604-329.000.

Applied Energy Systems, Inc.: *See—*
Buerkel, David H., 4,682,046, Cl. 307-138.000.

"AR-KAL" Plastics Products (1973): *See—*
Tabor, Elhanan, 4,681,130, Cl. 137-220.000.

Arai, Kenichi: *See—*
Tsuya, Noboru; and Arai, Kenichi, 4,682,206, Cl. 357-59.000.

Arai, Takao: *See—*
Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, 4,682,152, Cl. 340-347.0DD.
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.

Arai, Takeo: *See—*
Anno, Nobuo; and Arai, Takeo, 4,681,068, Cl. 123-41.860.

Arakawa, Hideki, to Fujitsu Limited. Voltage level detection circuit. 4,682,051, Cl. 307-359.000.

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Harrison, William H.; Arakawa, Mitsuaki; and McCarten, Barry M., 4,682,125, Cl. 333-12.000.

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Araki, Masashi; and Hibi, Takuo, to Sumitomo Chemical Company, Ltd. Method for producing compounds having a double bond at the terminal. 4,681,979, Cl. 585-640.000.

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Crounse, Kim H.; and Archibald, James B., 4,682,064, Cl. 310-61.000.

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Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

Arita, Yo: *See*—
Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, 4,681,863, Cl. 501-108.000.

Arkans, Edward J.: *See*—
Coble, Stephen J.; and Arkans, Edward J., 4,681,569, Cl. 604-253.000.

Arlt, Dieter: *See*—
Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, 4,681,952, Cl. 549-61.000.

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Kaneko, Atsumi, 4,682,218, Cl. 358-93.000.

Asahi Precision Co. Ltd.: *See*—
Kaneko, Kenji, 4,681,438, Cl. 356-143.000.

Asahi-Seiki Manufacturing Co., Ltd.: *See*—
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Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.

Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, to Fukuda Denshi Co., Ltd. Waterproof electrode assembly with transmitter for recording electrocardiogram. 4,681,118, Cl. 128-643.000.

Asakura, Masahiko: *See*—
Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.

Asano, Masaru: *See*—
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.

ASEA STAL Aktiebolag: *See*—
Bergkvist, Jorgen, 4,681,065, Cl. 122-4.00D.

Ash, Darrell L.: *See*—
Ragan, Lawrence H.; Hartmann, Clinton S.; and Ash, Darrell L., 4,682,223, Cl. 380-16.000.
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Ashimori Industry Co., Ltd.: *See*—
Hyodo, Masakatsu; and Yagi, Isaburo, 4,681,783, Cl. 428-36.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,681,926, Cl. 528-48.000.

Aspen Peripherals: *See*—
Smith, David E., 4,681,278, Cl. 242-195.000.

Asselberghs, Leopold: *See*—
Ruelle, Jean-Jacques; d'Andrea, Giacomo; and Asselberghs, Leopold, 4,680,958, Cl. 73-56.000.

Associated Electrical Industries Limited: *See*—
Hodkin, George A.; and Blane, Roger H., 4,681,988, Cl. 200-17.00R.

Astl, Franz. Device for detachably connecting two elements. 4,680,838, Cl. 24-442.000.

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Vanacore, Vincent D., 4,682,354, Cl. 379-211.000.

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Vanacore, Vincent D., 4,682,354, Cl. 379-211.000.
Werner, Jean J., 4,682,358, Cl. 379-411.000.

Atchley, Frederick P.: *See*—
Maroschak, Michael D.; Atchley, Frederick P.; and Everson, Douglas G., 4,681,684, Cl. 210-532.200.

Atkin, Howard S.; and Forth, Geoffrey A., to Dunlop Limited. Flexible belt for endless tracks made from a plurality of segments. 4,681,377, Cl. 305-35.0EB.

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Ingram, Alvin R., 4,681,779, Cl. 427-222.000.

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Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.

Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., to Kazakhsky Politekhnichesky Institute Imeni V.I. Lenina. Diamond crown bit. 4,681,174, Cl. 175-330.000.

Aucouturier, Jeanne; Leboutet, Hubert; and Pourre, Jean-Louis, to CGR/MEV. Power modulator provided with a transformer. 4,682,114, Cl. 328-67.000.

Ault, Russell L.: *See*—
Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., 4,681,722, Cl. 264-171.000.

Ausimont S.p.A.: *See*—
Gavezotti, Piero; and Strepparola, Ezio, 4,681,693, Cl. 252-49.900.
Strepparola, Ezio; and Re, Alberto, 4,681,925, Cl. 526-246.000.

Ausnit, Steven; and Bentsen, Per, to Minigrip, Incorporated. Attachment of plastic zipper to incompatible bag wall web. 4,682,366, Cl. 383-65.000.

Austad, John. Vegetable and fruit juice extracting machine. 4,681,031, Cl. 99-511.000.

Austgen-Biojet International Pty, Ltd.: *See*—
Tribe, David E., 4,681,852, Cl. 435-108.000.

Auto Glass Specialists, Inc.: *See*—
Birkhauser, Robert R., III, 4,681,520, Cl. 425-12.000.

Automation Associates, Inc.: *See*—
Moyer, William D., 4,680,842, Cl. 29-33.00P.

Automobiles Citroen: *See*—
Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, 4,682,294, Cl. 364-492.000.

Automobiles Peugeot: *See*—
Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, 4,682,294, Cl. 364-492.000.

Avdel Limited: *See*—
Jeal, Harvey P., 4,680,823, Cl. 10-86.00A.

Ayabe, Yasuhiro, to Victor Company of Japan, Ltd. Method of manufacturing a composite type magnetic head. 4,682,256, Cl. 360-119.000.

Ayen, Richard J.; Burk, Johst H.; and Greco, Carl C., to Stauffer Chemical Company. Preparation of insoluble metal alkoxides. 4,681,959, Cl. 556-54.000.

Azzam, Rasheed M. A., to Research Corporation. Photodetector arrangement for measuring the state of polarization of light. 4,681,450, Cl. 356-367.000.

Baba, Fujio: *See*—
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.

Bach, David T.; Gruenke, Roger A.; and Levin, Herman W., to Du Pont de Nemours, E. I., and Company. Optical detector cell. 4,681,443, Cl. 356-246.000.

Bachmann, Horst, to Robert Bosch GmbH. Interlocked television camera and electronic viewfinder combination. 4,682,240, Cl. 358-224.000.

Back, Gerhard; and Mosimann, Walter, to Ciba-Geigy Corporation. Process for dyeing natural or synthetic polyamide fibre materials with 1:1 metal complex dyes or mixtures of dyes with fluoride, fluorosilicate or fluoroborate. 4,681,596, Cl. 8-620.000.

Baffreau, Daniel: *See*—
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Baggio, Giorgio: *See*—
Pozzobon, Alessandro; and Baggio, Giorgio, 4,680,878, Cl. 36-117.000.

Bahov, Dinko A.; and Bahov, Hristo A., to NPK "Textiling Maschinostroene". Drawing apparatus. 4,680,833, Cl. 19-244.000.

Bahov, Hristo A.: *See*—
Bahov, Dinko A.; and Bahov, Hristo A., 4,680,833, Cl. 19-244.000.

Bailey, James R.; and Long, Eric L., to Switchcraft, Inc. Fiber optic connector and method of assembly. 4,681,398, Cl. 350-96.200.

Bailly, Francois P.; and Bourgoin, Alain, to Societe Anonyme de Telecommunications. Electronic feeding bridge for a space division switching network. 4,682,355, Cl. 379-346.000.

Baker, William R.: *See*—
Godbold, Thomas M.; and Baker, William R., 4,681,598, Cl. 44-1.0SR.

Bakermans, Frank C.; and Trexler, Charles J., to Du Pont de Nemours, E. I., and Company. Thick film planar filter connector having separate ground plane shield. 4,682,129, Cl. 333-184.000.

Bakow, Leon: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.

Baldwin, Francis P.: *See*—
Gardner, Irwin J.; Fusco, James V.; and Baldwin, Francis P., 4,681,921, Cl. 525-357.000.

Balint, Joseph P., Jr.; and Hargreaves, Richard E., to IMRE Corporation. Protein A-silica immunoadsorbent and process for its production. 4,681,870, Cl. 502-403.000.

Ball Corporation: *See*—
Wertz, Ronald D., 4,681,448, Cl. 356-352.000.

Balogh, John M.: *See*—
Balogh, Thomas K.; and Balogh, John M., 4,681,405, Cl. 350-420.000.

Balogh, Thomas K.; and Balogh, John M. Method and lens for producing a wide angle image. 4,681,405, Cl. 350-420.000.

Banati, Gabor: *See*—
Hiros, Laszlo; Banati, Gabor; and Lipscher, Ervin, 4,682,265, Cl. 361-231.000.

Bannister, Charles E., to Dowell Schlumberger Incorporated. Aqueous chemical wash compositions. 4,681,165, Cl. 166-312.000.

Baranski, Edward J. Twin arbor resaw with a fence having a continuous rotatable belt. 4,681,005, Cl. 83-404.400.

Barben, Theodore R., II, to TBI. Pure water conductivity sensor. 4,682,113, Cl. 324-441.000.

Bardue, Casey M.: *See*—
Jones, Paul W.; and Bardue, Casey M., 4,681,112, Cl. 128-419.00D.

Barito, Robert W.; and Downs, Kenneth L., to General Electric Company. Insulation formed of precipitated silica and fly ash. 4,681,788, Cl. 428-68.000.

Barlian, Reinhold: *See*—
Meiser, Roland; Burkert, Josef; and Bendel, Ralf, 4,682,009, Cl. 219-377.000.

Barmag AG: *See*—
Bauer, Karl, 4,680,872, Cl. 34-23.000.
Lenk, Erich, 4,681,522, Cl. 425-72.00S.

Barnard, Maxwell K. Self-fairing windmill vane. 4,681,512, Cl. 416-132.00B.

Barrett, John R., to Itek Corporation. Joule-Thomson cryostat having a chemically-deposited infrared detector and method of manufacture. 4,682,032, Cl. 250-352.000.

Bartell, Michael T. Apparatus and method for insertion of an intra-ocular lens. 4,681,102, Cl. 128-303.00R.

Bartesch, Helmut; and Florin, Gerd, to Sulzer-Escher Wyss Limited. Apparatus for treating soybeans. 4,681,029, Cl. 99-483.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Swivelable quick connector assembly. 4,681,351, Cl. 285-319.000.

Bartlett, Keith G.: *See*—
Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., 4,681,430, Cl. 355-77.000.

BASF Aktiengesellschaft: *See*—
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.
Etzbach, Karl-Heinz, 4,681,699, Cl. 252-299.100.
Pfaff, Klaus-Peter; Paust, Joachim; and Hartmann, Horst, 4,681,936, Cl. 536-124.000.
Ritter, Klaus; Michaelsen, Klaus; and Mair, Gunther, 4,681,328, Cl. 277-80.000.
Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, 4,681,977, Cl. 560-262.000.
Vogel, Hans-Henning, 4,681,719, Cl. 264-122.000.

Bastian, Robert E.: *See*—
Diepeveen, Neal; and Bastian, Robert E., 4,682,029, Cl. 250-330.000.

Bata Schuh AG: *See*—
Fink, Hans, 4,680,877, Cl. 36-44.000.

Bataille, Christian: *See*—
Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.

Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, to General Electric Company. Impact modified polyphenylene ether-polyamide compositions. 4,681,915, Cl. 525-148.000.

Bauer, Friedrich, to ENFO Grundlagenforschungs AG. Method of producing a spring plate. 4,680,847, Cl. 29-173.000.

Bauer, Karl, to Barmag AG. Yarn heating apparatus and method. 4,680,872, Cl. 34-23.000.

Bauer, Rudolf: *See*—
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.

Baum, Lloyd. Retention system for dental prosthesis. 4,681,542, Cl. 433-172.000.

Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, to Akzo NV. Method of and device for producing bundles of hollow fibers. 4,681,720, Cl. 264-150.000.

Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, to Bayer Aktiengesellschaft. Biologically active composition for purifying waste water and outgoing air. 4,681,851, Cl. 435-262.000.

Baumgarten, Rolf, to Heinrich Baumgarten KG. Hollow sheet metal utensil handle fastening assembly. 4,680,829, Cl. 16-114.00A.

Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, to BASF Aktiengesellschaft. Preparation of nicotinamide. 4,681,946, Cl. 546-317.000.

Bausch & Lomb Incorporated: *See*—
Council, Buford W., Jr., 4,680,998, Cl. 82-1.00C.
Krewalk, John J.; and Silverberg, Eric C., 4,682,091, Cl. 318-685.000.

Bayer Aktiengesellschaft: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.
Egerer, Peter; Crueger, Wulf; and Golker, Christian, 4,681,843, Cl. 435-41.000.
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.
Kruckenberg, Winfried; Leverenz, Klaus; and Otten, Hans-Gunter, 4,681,932, Cl. 534-575.000.
Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, 4,681,952, Cl. 549-61.000.
Marhold, Albrecht, 4,681,955, Cl. 549-362.000.
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.
Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, 4,681,922, Cl. 525-474.000.

Bead Chain Manufacturing Company: *See*—
Terita, Robert S., 4,681,392, Cl. 439-751.000.

Bean, John C., to American Telephone and Telegraph Company AT&T Bell Laboratories. Apparatus for simultaneous molecular beam deposition on a plurality of substrates. 4,681,773, Cl. 427-38.000.

Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., to Xerox Corporation. Brush end seals for blade cleaner housing. 4,681,426, Cl. 355-15.000.

Beasley, Michael W., to Unisys Corp. Minimum latency tie-breaking arbitration logic circuitry. 4,682,282, Cl. 364-200.000.

Beattie, Joanne L.: *See*—
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Beck, Walter; Berger, Siegfried; and Werner, Margrit, to Beck, Walter; and Werner, Margrit. Method and apparatus for aspirating secreted fluids from a wound. 4,681,562, Cl. 604-54.000.

Becker, Benedikt: *See*—
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.

Beckmann, Rudi, to Heckler & Koch GmbH. Cartridge feed mechanism. 4,681,018, Cl. 89-33.040.

Beckwith, Paul B., Jr.; and Bistarkey, Donald S., to Harris Corporation. Real time perspective display employing digital map generator. 4,682,160, Cl. 340-729.000.

Becton, Dickinson and Company: *See*—
Williams, Edward L., 4,681,218, Cl. 206-204.000.

Beer, Rafael; and Christiansen, Tyrone. Multiple image photography system. 4,681,415, Cl. 354-120.000.

Beer, Steve, to Elscint Ltd. NMR antenna and method for designing the same. 4,682,112, Cl. 324-322.000.

Behun, Eugene: *See*—
Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, 4,682,183, Cl. 346-75.000.

Beier, Sybille: *See*—
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.

Belanger, Victor: *See*—
Pratt, John D.; and Belanger, Victor, 4,681,494, Cl. 411-54.000.

Belart, Juan, to Teves, Alfred. Hydraulic brake system for automotive vehicles. 4,681,375, Cl. 303-114.000.

Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, to La Telemecanique Electrique. Remote control circuit breaker having a retractable switch contact. 4,682,132, Cl. 335-14.000.

Belknap, William M.: *See*—
Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.

Belko, Robert P.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.

Bellanti, Joseph A.: *See*—
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,681,762, Cl. 424-92.000.

Benchimol, Claude: *See*—
Tan, Siv C.; Le Galle, Didier; and Benchimol, Claude, 4,682,290, Cl. 364-414.000.

Bendall, Max R.; and Pegg, David T. Method of operating a nuclear magnetic resonance spectrometer. 4,682,107, Cl. 324-307.000.

Bendel, Ralf: *See*—
Meiser, Roland; Burkert, Josef; and Bendel, Ralf, 4,682,009, Cl. 219-377.000.

Bender, Reinhold H. W.: *See*—
Musser, John H.; and Bender, Reinhold H. W., 4,681,940, Cl. 546-174.000.

Bendit, Kurt J. Differential timer. 4,681,463, Cl. 368-96.000.

Beneke, Robert G. Container for an offshore fishing lure. 4,681,220, Cl. 206-315.110.

Bennett, Robert B., III; and Wagner, Donald W., to Universal Foods Corporation. Spice oleresin extraction process. 4,681,769, Cl. 426-540.000.

Benoit, Gordon L.; and Boyd, Dana M., to Mobil Oil Corporation. Thermoplastic film extrusion process employing die with filtering arrangement. 4,681,721, Cl. 264-169.000.

Benson, Keith; and McCormack, John, to Production Control Information (PCI) Limited. Production control system, especially for garment manufacture. 4,682,261, Cl. 364-468.000.

Bentsen, Per: *See*—
Ausnit, Steven; and Bentsen, Per, 4,682,366, Cl. 383-65.000.

Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, to International Business Machines Corporation. Small signal swing driver circuit. 4,682,050, Cl. 307-270.000.

Berecz, Imre, to Microdot Inc. Encapsulated fastener. 4,681,497, Cl. 411-377.000.

Bereznak, Bradley J.: *See*—
Chu, John W.; and Bereznak, Bradley J., 4,682,143, Cl. 338-307.000.

Berger, Abe; and Vora, Rohitkumar H., to M&T Chemicals Inc. Poly(amide-amide acid), polyamide acid, poly(esteramide acid), poly(amide-imide), polyimide, poly(esterimide) from poly arylene diamine. 4,681,928, Cl. 528-353.000.

Berger, Jacob: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.

Berger, Mitchel S.: *See*—
Boner, James C.; Berger, Mitchel S.; and Fine, Marc, 4,681,103, Cl. 128-303.00B.

Berger, Siegfried: *See*—
Beck, Walter; Berger, Siegfried; and Werner, Margrit, 4,681,562, Cl. 604-54.000.

Berggren, Randall G.: *See*—
Gale, Robert M.; and Berggren, Randall G., 4,681,584, Cl. 604-897.000.

Bergkvist, Jorgen, to ASEA STAL Aktiebolag. Multibed fluidized bed boiler. 4,681,065, Cl. 122-4.00D.

Bergquist, Thomas O. Support stand for a minnow trap. 4,680,887, Cl. 43-100.000.

Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., to Procter & Gamble Company, The. Detergent composition containing semi-polar nonionic detergent alkaline earth metal anionic detergent and amino alkylbetaine detergent. 4,681,704, Cl. 252-546.000.

Bernasconi, Marco L.: *See*—
Juzi, Heniz; and Bernasconi, Marco L., 4,681,129, Cl. 137-154.000.

Bernath, Oskar, to Georg Fischer Aktiegesellschaft Brugg. Mechanism for deposition of sheet metal. 4,681,003, Cl. 83-80.000.

Berthier, Claude M.; and Friend, Richard H., to British Petroleum Company, p.l.c., The. Novel composites of an ionic conducting polymer and an electronic conducting polymer. 4,681,822, Cl. 429-191.000.

Bertotti, Franco: *See*—
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.

Bes, Richard F. T.; and Knol, Jan D., to Holland Colours Apeldoorn B.V. Solid particulate coloring composition. 4,681,632, Cl. 106-19.000.

Beuneche, Daniel; Mauvieux, Christian; and Amiet, Pierre, to Fragema. Process and device for detecting leaking nuclear fuel elements in a nuclear assembly. 4,681,730, Cl. 376-252.000.

Beurskens, Godefridus P. F., to Hajime Industries Ltd. Apparatus for detecting containers having a deviating property. 4,682,220, Cl. 358-106.000.

Bezin, Michel. Safety stirrup for horse-riding. 4,680,921, Cl. 54-49.000.

Bhatt, Vipul, to AMP Incorporated. Optical switching arrangement. 4,681,397, Cl. 350-96.200.

Bicoll, Norton J. Anesthetic device. 4,681,101, Cl. 128-303.00R.

Bienert, Horst; and Kohlpaintner, Georg, to Webasto-Werk W. Baier GmbH & Co. Sliding roof for vehicles having a wind deflector. 4,681,364, Cl. 296-217.000.

Bintech (PTY) Ltd.: *See*—
Grobler, Jan H. A., 4,681,036, Cl. 102-275.300.

Bioscan, Inc.: *See*—
Shulman, Seth D., 4,682,035, Cl. 250-370.000.

Biostar Medical Products, Inc.: *See*—
Ozkan, Adil N., 4,681,782, Cl. 428-36.000.

Birkhauser, Robert R., III, to Auto Glass Specialists, Inc. Windshield repair assembly. 4,681,520, Cl. 425-12.000.

Bischofberger, Jurg; and Lattion, Andre , to Rieter Machine Works, Ltd. Open-end yarn piecer. 4,680,925, Cl. 57-263.000.

Bistarkey, Donald S.: *See*—
Beckwith, Paul B., Jr.; and Bistarkey, Donald S., 4,682,160, Cl. 340-729.000.

Bittler, Dieter: *See*—
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.

Bittner, Ronald D. Convertible water bed. 4,680,820, Cl. 5-451.000.

Blachman, Marc W.: *See*—
Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., 4,681,968, Cl. 558-361.000.

Black & Decker Inc.: *See*—
Abbratozzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., 4,682,066, Cl. 310-154.000.

Blackburn, William P.: *See*—
Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.

Blaimschein, Gottfried, to GFM Gesellschaft. Milling machine. 4,681,491, Cl. 409-200.000.

Blanchard, Christian: *See*—
Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.

Blane, Roger H.: *See*—
Hodkin, George A.; and Blane, Roger H., 4,681,988, Cl. 200-17.00R.

Blaney, Ted L.: *See*—
Toussant, John W.; and Blaney, Ted L., 4,681,579, Cl. 604-385.00R.

Blonder-Tongue Laboratories, Inc.: *See*—
Mistry, Kantilal, 4,682,359, Cl. 380-7.000.

Bloom, David M.; and Kolner, Brian H., to Stanford University. High speed testing of electronic circuits by electro-optic sampling. 4,681,449, Cl. 356-364.000.

Blumcraft of Pittsburgh: *See*—
Horgan, William J., Jr., 4,680,903, Cl. 52-127.800.

Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen. Auto-coupling tool for drill-pipes. 4,681,175, Cl. 175-393.000.

Boden, Richard M.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.

Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., to Chevron Research Company. Slidable electric valve device having a spring. 4,681,298, Cl. 251-129.100.

Boehringer Ingelheim Pharmaceuticals, Inc.: *See*—
Grozinger, Karl G.; and Oliver, James T., 4,681,884, Cl. 514-256.000.

Boehringer Mannheim GmbH: *See*—
Rosalki, Sidney B., 4,681,842, Cl. 435-21.000.

Boeing Company, The: *See*—
Bowdy, Fredrick E.; Glasenapp, Rudi K. H.; and Ridgway, Glen E., 4,681,285, Cl. 244-103.00R.
Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., 4,681,286, Cl. 244-129.500.
Furlong, James J.; and Howe, Dwayne E., 4,682,272, Cl. 361-437.000.
Glatfelter, Edward W., 4,681,511, Cl. 416-131.000.
Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., 4,681,602, Cl. 55-21.000.

Bogsch, Erik: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galamboa, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Bohn, Helmut: *See*—
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.

Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. Sulfonylureas and sulfonylthioureas, and method of use thereof as herbicides and/or growth regulators. 4,681,620, Cl. 71-93.000.

Bohner, Hal J. Wine temperature controller. 4,681,611, Cl. 62-3.000.

Bok, Edward, to Integrated Automation Limited. Improved method for double floating transport and processing of wafers. 4,681,776, Cl. 427-85.000.

Boles, Robert G.: *See*—
Farley, Harold C.; and Boles, Robert G., 4,681,013, Cl. 89-1.815.

Boliden Aktiebolag: *See*—
Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., 4,681,268, Cl. 241-24.000.

Bollerhey, Rolf, to Mannesmann AG. Dust removal. 4,681,607, Cl. 55-284.000.

Bolliger, Georg: *See*—
Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.

Bollini, Jakob L.: *See*—
Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, 4,681,710, Cl. 260-508.000.

Bolton, John D'Arcy. Safety ski harness. 4,681,337, Cl. 280-615.000.

Boner, James C.; Berger, Mitchel S.; and Fine, Marc, to Diasonics, Inc. Ultrasound guided surgical instrument guide and method. 4,681,103, Cl. 128-303.00B.

Boneta, Louis, to Moose Industries, Inc. Snow plow for small vehicles. 4,680,880, Cl. 37-236.000.

Bontemps, Raymond. Portable device for skin massage by cold. 4,681,095, Cl. 128-24.100.

Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., to Amerace Corporation. Fail-safe sensor system. 4,682,153, Cl. 340-507.000.

Borell, Michael C.: *See*—
Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., 4,681,268, Cl. 241-24.000.

Borst, Gaylord M.: *See*—
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., 4,681,056, Cl. 114-146.000.

Bos, Sinnighe J.: *See*—
Duurland, Jozef M.; Bos, Sinnighe J.; and Kreeft, Hendrik K., 4,681,280, Cl. 242-199.000.

Bosley, Bruce C.: *See*—
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.

Bottomley, Paul A.: *See*—
Vatis, Dimitrios; Bottomley, Paul A.; and Foster, Thomas H., 4,682,106, Cl. 324-307.000.

Boucherie, Leonel, to G.B. Boucherie, Firma. Process for removing the wrapper from a fibre bundle. 4,680,850, Cl. 29-426.300.

Bouchut, Pierre: *See*—
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Boulanger, Edward, to Lance Wire and Cable, Inc. Integral connector having plastic spring-clips. 4,681,386, Cl. 439-347.000.

Bouley, Jean C., to Allied Corporation. Electric connector. 4,681,391, Cl. 439-444.000.

Bourgoin, Alain: *See*—
Bailly, Francois P.; and Bourgoin, Alain, 4,682,355, Cl. 379-346.000.

Bowdy, Fredrick E.; Glasenapp, Rudi K. H.; and Ridgway, Glen E., to Boeing Company, The. Nose wheel water spray deflector enabling wheel and tire changes without deflector removal. 4,681,285, Cl. 244-103.00R.

Bowman, Norman E., to Don Gilbert Industries, Inc. Emergency sign. 4,682,147, Cl. 340-286.00R.

Boyd, Dana M.: *See*—
Benoit, Gordon L.; and Boyd, Dana M., 4,681,721, Cl. 264-169.000.

Boyd, Harper, to Boyd's Bit Service, Inc. Borehole drill pipe continuous side entry or exit apparatus and method. 4,681,162, Cl. 166-242.000.

Boyd's Bit Service, Inc.: *See*—
Boyd, Harper, 4,681,162, Cl. 166-242.000.

Bozung, Hanns-Gunther; and Nachtigal, Joachim, to Siemens Aktiengesellschaft. Control device for an internal combustion engine with an exhaust gas turbocharger. 4,680,933, Cl. 60-608.000.

BP Chemicals Limited: *See*—
Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.
Green, Michael J., 4,681,967, Cl. 558-277.000.

Brabb, James D.; and Simpson, Dennis L., to White Castle System, Inc. Swath-controlling variable chute and chute-activated damper for a broadcast spreader. 4,681,265, Cl. 239-665.000.

Brach, Reiner, to Reiner Brach Import-Export. Method for dressing hot rolled strip coils, especially coilbox coils. 4,680,951, Cl. 72-160.000.

Brahm, Richard: *See*—
Franke, Werner; and Brahm, Richard, 4,681,827, Cl. 430-83.000.

Braitinger, Helmut: *See*—
Schneider, Franz; Braitinger, Helmut; and Feinauer, Otto, 4,682,280, Cl. 364-191.000.

Brammall, Terrence; and Guiler, Richard S., to Trans-Guard Industries, Inc. Security seal for use with stranded cable. 4,681,355, Cl. 292-323.000.

Brammall, Terrence N., to Trans-Guard Industries, Inc. Conical cable lock. 4,681,356, Cl. 292-327.000.

Brand, Larry M., to Procter & Gamble Company, The. Pharmaceutical products providing enhanced analgesia. 4,681,897, Cl. 514-557.000.

Brandell, John R. Golf exercise device. 4,681,317, Cl. 272-137.000.

Brandl, Rudolf; and Matt, Heinz, to Heckler & Koch GmbH. Magazine for automatic weapons. 4,681,019, Cl. 89-33.040.

Brandt, Inc.: *See*—
Taipale, Dale L.; and Brome, John G., 4,682,288, Cl. 364-406.000.

Brandt, Sherry L.: *See*—
Anderson, Arthur B.; and Brandt, Sherry L., 4,681,578, Cl. 604-385.00R.

Brann, Dale: *See*—
Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, 4,680,815, Cl. 2-171.300.

Brantl, Victor: *See*—
Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich, 4,681,871, Cl. 514-15.000.

Brasch, William R., to LeaRonal, Inc. Method of making copper colloid for activating insulating surfaces. 4,681,630, Cl. 106-1.110.

Braun, Hermann: *See*—
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.

Braun, Jeffrey J.: *See*—
MacAskill, Robert B.; and Braun, Jeffrey J., 4,682,082, Cl. 315-219.000.

Braun, Leroy O.: *See*—
Hendrix, James L.; and Braun, Leroy O., 4,682,336, Cl. 372-10.000.

Brawner, Clarence A., Jr. Truck level sensing and indicating system. 4,682,145, Cl. 340-52.00H.

Brazeway, Inc.: *See*—
Miller, Donald E., 4,680,845, Cl. 29-157.00R.

BRD Company Limited: *See*—
Palmer, Bertram J., 4,681,556, Cl. 464-181.000.

Breemer, Johannes, to N.V. Optische Industrie "De Oude Delft". Device for detecting differences in color. 4,681,454, Cl. 356-402.000.

Breitenstein, Charles T.; and Holecek, Allen R., to Carbide International Inc. Tool unloading mechanism for automatic tool grinding machine. 4,680,896, Cl. 51-215.0UE.

Brennan, Michael E.: *See*—
Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.

Bresson, Clarence R.; and Parlman, Robert M., to Phillips Petroleum Company. Ore flotation. 4,681,675, Cl. 209-167.000.

Breuer, Peter: *See*—
Schulz, Rene ; Teubler, Heinz; and Breuer, Peter, 4,681,517, Cl. 417-300.000.

Breunig, Charles F.: *See*—
Stiefel, Werner K.; and Breunig, Charles F., 4,681,635, Cl. 106-178.000.

Bridgestone Corporation: *See*—
Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.

Brigham, David F.: *See*—
Gavin, F. Paul; Brigham, David F.; and Gavin, Ann H., 4,681,901, Cl. 521-54.000.

Briner, Emil; and Hieronymi, Richard, to Rieter Machine Works Limited. Method of starting spinning of a yarn in a friction spinning device. 4,680,924, Cl. 57-263.000.

Brisset, Jean-Paul: *See*—
Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

British Petroleum Company p.l.c., The: *See*—
Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., 4,681,707, Cl. 260-410.90R.
Berthier, Claude M.; and Friend, Richard H., 4,681,822, Cl. 429-191.000.

British Telecommunications public limited company: *See*—
Whitehead, Graham K.; and Taylor, Kenneth, 4,682,270, Cl. 361-401.000.

Brittain, Kent R.: *See*—
Olson, Keith E.; and Brittain, Kent R., 4,681,914, Cl. 252-91.000.

Broderick, Dennis W.; and Vincent, Harold L., to Dow Corning Corporation. Hard organopolysiloxane release coating. 4,681,908, Cl. 524-268.000.

Brodeur, Rene H.; and Terlecky, Boris S., to Trailer Train Company. Railroad car with universal coupling capability. 4,681,040, Cl. 105-3.000.

Brodman, Richard F.; and Siegel, Sharon B. Intracardiac catheter and a method for detecting myocardial ischemia. 4,681,117, Cl. 128-642.000.

Brome, John G.: *See*—
Taipale, Dale L.; and Brome, John G., 4,682,288, Cl. 364-406.000.

Brookbank, Earl B., III, to TRW, Inc. Apparatus and method for supplying electric power to cable suspended submergible pumps. 4,681,169, Cl. 166-385.000.

Brooks, Forrest E., to ITT Corporation. Method for writing characters on a liquid crystal display. 4,682,163, Cl. 340-805.000.

Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., to United States of America, Energy. Process for the chemical preparation of high-field ZnO varistors. 4,681,717, Cl. 264-61.000.

Brotz, Gregory R. Thermovoltaic cells. 4,681,981, Cl. 136-205.000.

Brouwer Turf Equipment Limited: *See*—
Arnold, William T., 4,680,922, Cl. 56-7.000.

Brown, David J., to Massey-Ferguson Services N.V. Transmission direction selection system. 4,680,983, Cl. 74-474.000.

Brown, David M. Collapsible sawhorse. 4,681,187, Cl. 182-129.000.

Brown, John G. Coverings providing impact sound isolation. 4,681,786, Cl. 428-44.000.

Brown, Robert R., to Colt Industries Inc. Vehicular air intake scoop. 4,681,178, Cl. 180-68.300.

Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Histamine H_2-antagonist oxazole and thiazole derivatives and compositions therefor. 4,681,883, Cl. 514-212.000.

Brown & Williamson Tobacco Corporation: *See*—
Johnson, Robert R., 4,681,125, Cl. 131-336.000.
Strubel, David G.; and Sanford, Robert A., 4,681,126, Cl. 131-370.000.

Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., to Lockheed Corporation. Vacuum bag sealing system. 4,681,651, Cl. 156-382.000.

Bruegge, Anthony J.; and Daughtery, Denny E., to Chemed Corporation. Solid stabilized active halogen-containing detergent compositions and methods. 4,681,696, Cl. 252-99.000.

Brunelle, Daniel J., to General Electric Company. Bis-aminopyridinium salts as phase transfer catalysts for aromatic ether imide preparation. 4,681,949, Cl. 548-461.000.

Brunner, Erwin: *See*—
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.

Brunner, Heinz; and Seeger, Stefan, to SIPRA Patententwicklungs-und Beteiligungsgesellschaft mbH. Arrangement for positive supply of elastomer filaments in textile machines. 4,681,272, Cl. 242-47.010.

Brustle, Klaus: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,680,830, Cl. 16-241.000.

Brychta, Ondrej; and Zabrodsky, Vladimir, to Konstruktiva Trencin, narodny podnik. Multinozzle generator for high frequency nozzle ventilation of lungs. 4,681,100, Cl. 128-204.250.

BSG-Schalttechnik GmbH & Co. KG: *See*—
Lohner, Martin; and Prestel, Fritz, 4,682,142, Cl. 338-172.000.

Budge, John R.; and Compton, Senja V., to Standard Oil Company, The. Oxygenate condensation catalyst. 4,681,868, Cl. 502-307.000.

Budke, Mark: *See*—
Allwin, Roger P.; and Budke, Mark, 4,681,159, Cl. 166-124.000.

Budny, Rick R. Method and device for reclaiming fluid lubricants. 4,681,660, Cl. 196-46.100.

Bue, Richard L.; and Ratchford Michael, to United Technologies Corporation. Fault tolerant flight data recorder. 4,682,292, Cl. 364-424.000.

Buechle, Karl-Heinz: *See*—
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Buerkel, David H., to Applied Energy Systems, Inc. Positive or negative voltage power supply with slideable carrier switching mechanism. 4,682,046, Cl. 307-138.000.

Bugg, Richard E. F., to U.S. Philips Corporation. Variable size character display without loss of obscured character positions. 4,682,161, Cl. 340-731.000.

Bujalski, Duane R., to Dow Corning Corporation. Ceramic materials from polycarbosilanes. 4,681,860, Cl. 501-88.000.

Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, to Siemens Aktiengesellschaft. Filter functioning with acoustic waves. 4,682,130, Cl. 333-195.000.

Burghoff, Heinz-Georg: *See*—
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, to Max Kammerer GmbH. Process and apparatus for the production of strands for Bowden cables. 4,680,952, Cl. 72-161.000.

Burk, Johst H.: *See*—
Ayen, Richard J.; Burk, Johst H.; and Greco, Carl C., 4,681,959, Cl. 556-54.000.

Burke, Hubert K.; and Michon, Gerald J., to General Electric Company. High-sensitivity CID photometer/radiometer. 4,681,440, Cl. 356-218.000.

Burkert, Josef: *See*—
Meiser, Roland; Burkert, Josef; and Bendel, Ralf, 4,682,009, Cl. 219-377.000.

Burnett, Sibley C.: *See*—
Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., 4,680,936, Cl. 62-45.000.

Burrington, James D.: *See*—
Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., 4,681,968, Cl. 558-361.000.

Burroughs Corporation: *See*—
Ragle, Herbert U., 4,682,039, Cl. 250-560.000.

Burroughs Wellcome Co.: *See*—
McDermed, John D., 4,681,878, Cl. 514-223.000.

Burton, Craig A.: *See*—
Helland, Randall H.; and Burton, Craig A., 4,681,830, Cl. 430-110.000.

Busby, Bruce E., to Sony Corporation. Method and apparatus for updating optical memory disc. 4,682,318, Cl. 369-59.000.

Bush, Earl D., to Handy Button Machine Company. Tapered surface panel retainer. 4,680,915, Cl. 52-766.000.

Butka, Kemal. Vessel such a ship, boat and the like provided with stabilizing means. 4,681,053, Cl. 114-122.000.

Buzas, Attila: *See*—
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , 4,682,137, Cl. 335-284.000.

Buzdov, Ruslan D.: *See*—
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

Byrne, Barbara J.: *See*—
Byrne, Larry D.; and Byrne, Barbara J., 4,681,597, Cl. 44-15.00R.

Byrne, John V.: *See*—
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.

Byrne, Larry D.; and Byrne, Barbara J. Method for agglomerating powdered coal by compaction. 4,681,597, Cl. 44-15.00R.

Byrum, James E. IC carrier system. 4,681,656, Cl. 156-645.000.

C-I-L Inc.: *See*—
Murray, Charles R.; and Harrison, Ray E., 4,681,781, Cl. 428-35.000.

C. M. Smillie & Company: *See*—
Kazmierski, Ronald J., 4,681,992, Cl. 200-82.00E.

C. R. Bard, Inc.: *See*—
Nehring, John R., 4,681,571, Cl. 604-320.000.

Cable Technology Laboratories, Inc.: *See*—
Katz, Carlos; Dima, Attila F.; and Eager, George S., Jr., 4,681,985, Cl. 174-73.00R.

CACI, Inc. - Federal: *See*—
Rice, Mark S.; and Hunt, Paul D., 4,681,054, Cl. 114-124.000.

Calgon Corporation: *See*—
Walker, Jerry L.; and Zupanovich, John D., 4,681,737, Cl. 422-16.000.

California Devices, Inc.: *See*—
Lipp, Robert, 4,682,201, Cl. 357-42.000.

Calzaturificio F.lli Danieli S.p.A.: *See*—
Danieli, Diego, 4,680,875, Cl. 36-31.000.

Camilleri, Paul, to S.W.R. (Australia) Pty. Ltd. Casting of structural walls. 4,681,483, Cl. 405-267.000.

Canada, Her Majesty the Queen in right of: *See*—
Saint, David H.; and Funk, John W., 4,682,034, Cl. 250-363.00R.

Candau, Francoise: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.

Canon Kabushiki Kaisha: *See*—
Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, 4,681,417, Cl. 354-234.100.
Ikeda, Yoshinori, 4,682,190, Cl. 346-154.000.
Kaji, Toshio, 4,682,211, Cl. 358-41.000.
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.
Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuichi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.
Kodaira, Takanori, 4,681,418, Cl. 354-288.000.
Kosugi, Masao, 4,682,037, Cl. 250-548.000.
Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, 4,682,019, Cl. 250-211.00R.
Okada, Shinjiro; and Kanbe, Junichiro, 4,681,404, Cl. 350-350.00S.
Sakai, Shinji; and Kawabata, Takashi, 4,681,419, Cl. 354-402.000.
Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, 4,682,186, Cl. 346-140.00R.
Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
Sugita, Yasutoshi, 4,682,242, Cl. 358-285.000.
Suwa, Kaname, 4,681,987, Cl. 200-5.00A.
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.
Tateoka, Masamichi; and Yano, Hideaki, 4,682,316, Cl. 369-46.000.
Terasawa, Koji, 4,682,184, Cl. 346-140.00R.
Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,681,441, Cl. 356-222.000.
Yamada, Akira; and Tokura, Go, 4,681,421, Cl. 354-485.000.

Cantello, Maichi: *See*—
Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, 4,682,002, Cl. 219-121.0LD.

Carbide International Inc.: *See*—
Breitenstein, Charles T.; and Holecek, Allen R., 4,680,896, Cl. 51-215.0UE.

Carl Schenck AG: *See*—
Dodt, Hans-Walter, 4,680,975, Cl. 73-862.090.

Carl-Zeiss-Stiftung: *See*—
Hoffmeister, Dietrich, 4,680,945, Cl. 62-514.00R.

Carlin, Bruce. Method for providing wall storage. 4,681,380, Cl. 312-242.000.

Carlson, Danis R. Process for treating plants. 4,680,889, Cl. 47-58.000.

Carolina Power & Light Company: *See*—
Robertson, Carlton E., 4,681,705, Cl. 252-631.000.

Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., to Pangborn Corporation. Portable abrasive throwing wheel device. 4,680,899, Cl. 51-427.000.

Carpenter, James H., Jr. Method and apparatus for cleaning workpieces. 4,680,898, Cl. 51-419.000.

Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., to Owens-Corning Fiberglas Corporation. Method of making a lineal structural member. 4,681,722, Cl. 264-171.000.

Carty, John J. Chimney stack having erodable liner with electrical generating capacity. 4,681,025, Cl. 98-58.000.

Caselli, Joseph M., Sr. Leadered fishing lure holder with means for receiving leader and hooks. 4,680,886, Cl. 43-57.100.

Casio Computer Co., Ltd.: *See*—
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.

Cassella Aktiengesellschaft: *See*—
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.

Castellano, Pietro, to Ing. C. Olivetti & C., S.p.A. Serial ink jet printing arrangement providing a removably mounting of the printing head on a carriage. 4,682,188, Cl. 346-140.00R.

Castolin S.A.: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,681,734, Cl. 419-9.000.

Caterpillar Inc.: *See*—
Hoffman, John P., 4,682,151, Cl. 340-347.0SY.
Zborowski, David G., 4,681,177, Cl. 180-9.560.

Catier, Gerard: *See*—
Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

Catsouras, George: *See*—
Grech, Leonard, 4,681,084, Cl. 126-52.000.

Cattaneo, Pierre, to Lem S.A. Current transformer for direct and alternating current. 4,682,101, Cl. 324-117.00H.

Cavalli, Alfredo. Apparatus for preparing ice cream and the like. 4,681,458, Cl. 366-149.000.

Cawthorne, Duane C., to United States of America, Energy. Energy-efficient lighting system for television. 4,682,238, Cl. 358-228.000.

CCaley, Douglas A., to Paccar Inc. Air drying system for pneumatic circuits. 4,680,938, Cl. 62-93.000.

Cedercreutz, Axel; and Salminen, Ari, to Tamfelt Oy AB. Spiral wire and a method of manufacturing such a wire. 4,681,287, Cl. 245-6.000.

Celanese Corporation: *See*—
Letinski, John S., 4,681,716, Cl. 264-53.000.

CEM Corporation: *See*—
Collins, Michael J.; and Hargett, Wyatt P., Jr., 4,681,996, Cl. 219-10.55M.

Cemedine Co., Ltd.: *See*—
Ikeda, Shigeru; and Okamura, Naomi, 4,681,524, Cl. 425-376.00R.

Centaur Sciences, Inc.: *See*—
Deckert, Clinton; and Wilson, Larry L., 4,681,563, Cl. 604-67.000.

Centore, Anthony. Round electrical cable adapting tool. 4,680,852, Cl. 29-461.000.

Central Research Institute of Electric Power Industry: *See*—
Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.

Central Security Mfg. Corp.: *See*—
Shirley, John R., 4,682,155, Cl. 340-573.000.

Cermetek Microelectronics, Inc.: *See*—
Durham, Stephen J., 4,682,352, Cl. 379-98.000.

Cervantes, Joe A., Jr.: *See*—
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

Cetus Corporation: *See*—
Johnson, Larry J.; Coates, Stephen R.; and Loor, Rueyming, 4,681,742, Cl. 422-102.000.

CGR/MEV: *See*—
Aucouturier, Jeanne; Leboutet, Hubert; and Pourre, Jean-Louis, 4,682,114, Cl. 328-67.000.

Chambers, Gregory R.: *See*—
Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, 4,681,915, Cl. 525-148.000.

Chamran, Delories M., legal representative: *See*—
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,681,444, Cl. 356-318.000.

Chamran, Morteza M., deceased: *See*—
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,681,444, Cl. 356-318.000.

Chang, Biau-Hung, to National Distillers and Chemical Corporation. Process for converting an alkoxyalkadiene to an alkyl dialkoxyalkanoate. 4,681,708, Cl. 260-410.900.

Chang, Biau-Hung; and Hanes, Ronnie M., to National Distillers and Chemical Corporation. Alkyl 9-alkoxy-7-nonenoates. 4,681,709, Cl. 260-410.900.

Chang, Ike Y., to E.I. Du Pont de Nemours and Company. Reinforced composites. 4,681,911, Cl. 524-607.000.

Chang, Paul S.; and Dowling, Edward C., to AMP Incorporated. Time-slot addressed, system keyed multiplex device. 4,682,168, Cl. 340-825.650.

Chapman, Dale B., to International Business Machines Corporation. Phase discriminator and data standardizer. 4,682,121, Cl. 331-1.00A.

Charbonnier, Roger: *See*—
Remy, Joel; and Charbonnier, Roger, 4,682,122, Cl. 331-2.000.

Charles Wyle Engineering Corporation: *See*—
Sirkin, Robert, 4,681,242, Cl. 222-41.000.

Chaudhari, Atma; and Lee, Joseph K. S., to Warner-Lambert Company. Dissolution cell and method for determining the in-vitro release of a drug. 4,681,858, Cl. 436-165.000.

Chaumont, Roger: *See*—
Delons, Luc; and Chaumont, Roger, 4,681,680, Cl. 210-110.000.

Chemed Corporation: *See—*
Bruegge, Anthony J.; and Daughtery, Denny E., 4,681,696, Cl. 252-99.000.

Chen, Chin-Chi; and Lin, Yung-Shing. Golf club head. 4,681,321, Cl. 273-167.00H.

Cheney, Paul G.: *See—*
Eian, Gilbert; and Cheney, Paul G., 4,681,801, Cl. 428-283.000.

Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,680,927, Cl. 60-39.300.

Chevron Research Company: *See—*
Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.

Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., to International Business Machines Corporation. Holder for plastic leaded chip carrier. 4,681,221, Cl. 206-328.000.

Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., to Texaco Inc. Method for determining quality of reduced quality steam. 4,681,466, Cl. 374-42.000.

Childress, Jeffery S.; Dissosway, Marc A.; and Hughes, Houston H., III, to General Electric Company. Mobile radio communications system with join feature. 4,682,367, Cl. 455-17.000.

Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L. Femtosecond laser pulse measuring system. 4,681,436, Cl. 356-121.000.

Chion, Pierre; and Menault, Jacques, to Rhovyl. Process for disperse dyeing dry-spun atactic polyvinyl chloride-based filaments and fibres before drawing. 4,681,594, Cl. 8-489.000.

Chion, Pierre; and Menault, Jacques, to Rhovyl. Process for disperse dyeing dry-spun atactic polyvinyl chloride-based filaments and fibres after drawing the wet tow. 4,681,595, Cl. 8-489.000.

Chism, Samuel B., Jr., to Ford Aerospace & Communications Corporation. Ortho-linear imaging device. 4,682,235, Cl. 358-212.000.

Chiu, Fang-Ting: *See—*
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.

Cho, George E. S.; and Kessler, Stephen B., to Kontron Inc. Balloon catheter wrapping apparatus. 4,681,092, Cl. 128-1.00D.

Chrise, James R.: *See—*
Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.

Christiansen, Tyrone: *See—*
Beer, Rafael; and Christiansen, Tyrone, 4,681,415, Cl. 354-120.000.

Christopulos, John A., to United States of America, Army. Dual battery connector arrangement. 4,681,821, Cl. 429-121.000.

Chrysler Motors Corporation: *See—*
Hassan, Morris, 4,681,304, Cl. 267-8.00R.
Sullivan, Thomas M., 4,682,088, Cl. 318-568.000.

Chu, Chung K.; and Schinazi, Raymond F., to University of Georgia Research Foundation, Inc.; and Emory University. 2',3'-dideoxy-5-substituted uridines and related compounds as antiviral agents. 4,681,933, Cl. 536-23.000.

Chu, John W.; and Bereznak, Bradley J., to Advanced Micro Devices, Inc. Thin film chromium-silicon-carbon resistor. 4,682,143, Cl. 338-307.000.

Chung, Jing-Yau, to Exxon Production Research Company. Rod-type multipole source for acoustic well logging. 4,682,308, Cl. 367-31.000.

Chung, Landy. Boiler furnace air register. 4,681,532, Cl. 431-183.000.

Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., to Boeing Company, The. Door anti-hijacking latch/lock mechanism with pneumatic decompression override. 4,681,286, Cl. 244-129.500.

Churyo Engineering Co., Ltd.: *See—*
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Ciba-Geigy Corporation: *See—*
Back, Gerhard; and Mosimann, Walter, 4,681,596, Cl. 8-620.000.
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.
Demmer, Christopher G.; and Irving, Edward, 4,681,923, Cl. 525-504.000.
Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, 4,681,593, Cl. 8-128.00R.
Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, 4,681,950, Cl. 549-27.000.
Meyer, Willy; and Fory, Werner, 4,681,619, Cl. 71-92.000.
Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, 4,681,710, Cl. 260-508.000.
Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., 4,681,971, Cl. 558-414.000.
Schiek, Robert C., 4,681,638, Cl. 106-309.000.
Traxler, Peter, 4,681,938, Cl. 540-458.000.

Cirrito, William: *See—*
Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, 4,680,815, Cl. 2-171.300.

Citizen Watch Co., Ltd.: *See—*
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.
Nabeyama, Takatoshi; and Sakita, Eiichi, 4,681,459, Cl. 368-16.000.
Nishimura, Katsuo, 4,681,460, Cl. 368-21.000.

Clarion Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Akira, 4,682,045, Cl. 307-125.000.

Clark, Frank J.: *See—*
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, to Syntex (U.S.A.) Inc. Method for treating cardiovascular disease with calcium channel antagonists. 4,681,889, Cl. 514-307.000.

Clark, Ronald K.: *See—*
Unnam, Jalaiah; and Clark, Ronald K., 4,681,818, Cl. 428-607.000.

Clasen, Rolf; and Scholz, Heinz, to U.S. Philips Corporation. Method of manufacturing glass bodies. 4,681,614, Cl. 65-18.100.

Clausen, Peter J. M.: *See—*
Petersen, Jorgen H.; and Clausen, Peter J. M., 4,681,533, Cl. 431-208.000.

Clawson, Lawrence G., to Raytheon Company. High condensing recuperative furnace. 4,681,085, Cl. 126-110.00R.

Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., to International Business Machines Corporation. Flexible film semiconductor chip carrier. 4,681,654, Cl. 156-630.000.

Clemons, Johnny M.: *See—*
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.

Cloutier, Richard. Snow blower with snow channel of vertical scraper snow belts. 4,680,881, Cl. 37-237.000.

Coates, Fredrica V. Adjustable size diaper and folding method therefor. 4,681,581, Cl. 604-391.000.

Coates, Philip V.; and Eaton, Brian J., to Emi Limited. Controlling the grey levels represented by a video signal. 4,682,229, Cl. 358-166.000.

Coates, Stephen R.: *See—*
Johnson, Larry J.; Coates, Stephen R.; and Loor, Rueyming, 4,681,742, Cl. 422-102.000.

Coatex S.A.: *See—*
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Cobe Laboratories, Inc.: *See—*
Swan, Jack C., Jr.; and Poggioli, Paolo, 4,681,606, Cl. 55-193.000.

Cobelplast N.V.S.A.: *See—*
Van Iseghem, Augustinus E. M., 4,681,797, Cl. 428-212.000.

Coble, Stephen J.; and Arkans, Edward J. IV rate meter. 4,681,569, Cl. 604-253.000.

Coca-Cola Company, The: *See—*
Credle, William S., Jr., 4,681,518, Cl. 417-395.000.

Cochran, Wilson V., to Toro Company, The. Two piece variable stator for sprinkler nozzle flow control. 4,681,260, Cl. 239-240.000.

Cockman, Haggie I. Low profile sprinkler head. 4,681,263, Cl. 239-391.000.

Cohen, Joel R.: *See—*
Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, 4,682,126, Cl. 333-81.00B.

Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., to Firestone Tire & Rubber Company, The. Use of rubber solvent-resin solvent and miscella mixtures for extraction-expression of rubber and resins from guayule shrub. 4,681,929, Cl. 528-493.000.

Coleman Company, Inc., The: *See—*
Nedoluha, Heinz F., 4,681,052, Cl. 114-98.000.

Colgate, Stirling A.; and Roos, George E. Fast burning propellants. 4,681,643, Cl. 149-21.000.

Collins, Michael J.; and Hargett, Wyatt P., Jr., to CEM Corporation. Analytical process in which materials to be analyzed are directly and indirectly heated and dried by microwave radiation. 4,681,996, Cl. 219-10.55M.

Colombani, Louie V. Multiple-ring toilet seat assembly and mounting means. 4,680,816, Cl. 4-240.000.

Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Delivery device for zero-order release of an active principle into a dissolution fluid and process for its preparation. 4,681,755, Cl. 424-486.000.

Colon, Herman; and Maletsky, Albert, to Malcolm Nicol & Co. Wetness indicating hot-metal adhesives. 4,681,576, Cl. 604-361.000.

Colpo Co., Ltd.: *See—*
Takasugi, Mitsuo, 4,681,243, Cl. 222-83.000.

Colt Industries Inc: *See—*
Brown, Robert R., 4,681,178, Cl. 180-68.300.

Combustion Engineering, Inc.: *See—*
Leaseburge, Emory J.; and Melda, Kenneth J., 4,681,678, Cl. 210-101.000.

Comet - Construzione Occhiali Metallo S.p.A.: *See—*
Taddei, Lorenzo, 4,681,411, Cl. 351-137.000.

Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, to Societe Prolabo. Apparatus for the chemical reaction by wet process of various products. 4,681,740, Cl. 422-78.000.

Compagnie Industrielle Des Telecommunications Cit-Alcatel: *See—*
Le Mouel, Bernard; Le Bescont, Herve ; and Le Meur, Jean-Paul, 4,682,334, Cl. 371-55.000.

Compton, Senja V.: *See—*
Budge, John R.; and Compton, Senja V., 4,681,868, Cl. 502-307.000.

CompuSonics Video Corporation: *See—*
Schwartz, David M., 4,682,248, Cl. 360-32.000.

Conero, Ronald S.; and Landis, Terry L., to Ivac Corporation. Optical flow sensor. 4,680,977, Cl. 73-861.410.

Conley, Ralph R.: *See—*
Wetzler, Dallas G.; and Conley, Ralph R., 4,681,261, Cl. 239-265.190.

Conrac Corporation: *See—*
Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., 4,682,000, Cl. 219-116.000.

Conrad Scholtz AG: *See—*
Nolte, Gunther, 4,681,503, Cl. 414-144.000.

Conroy, Gary M.: *See*—
Mesch, Keith A.; and Conroy, Gary M., 4,681,907, Cl. 524-180.000.

Conte, Ubaldo: *See*—
Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, 4,681,755, Cl. 424-486.000.

Contin, Jose L., to MDC Vacuum Products Corporation. High vacuum gate valve having improved metal vacuum seal joint. 4,681,329, Cl. 277-167.500.

Cook, Barry: *See*—
Richardson, Norman; Holt, Brian; and Cook, Barry, 4,681,686, Cl. 210-699.000.

Cook, Phillip D.: *See*—
McNamara, Dennis J.; and Cook, Phillip D., 4,681,873, Cl. 514-50.000.

Cook, Sanford L.; and Kirkup, David, to Standard-Keil Hardware Manufacturing Co. Hardware for mounting a sliding door panel. 4,680,828, Cl. 16-90.000.

Cooper, Thomas F., to Xerox Corporation. Sorting apparatus. 4,681,310, Cl. 270-53.000.

CooperVision, Inc.: *See*—
Hood, Larry L.; and Imonti, Maurice M., 4,681,561, Cl. 604-22.000.

Coplans, Carl W., to Seton Products Limited. Corset. 4,681,113, Cl. 450-134.000.

Cordis Corporation: *See*—
Hooven, Michael D., 4,681,559, Cl. 604-9.000.

Corfield, Kenneth G.; and Heeks, John S., to Standard Telephones and Cables Public Limited Company. Interconnecting integrated circuits. 4,682,323, Cl. 370-4.000.

Cornils, Gerd: *See*—
Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, 4,681,794, Cl. 428-188.000.

Corning Glass Works: *See*—
DeAngelis, Thomas P.; and Day, John P., 4,681,624, Cl. 75-28.000.

Costa Mas, Miguel-Angel. Integral accelerator-brake control for motorcycles. 4,681,198, Cl. 192-3.00S.

Cosulich, Joseph J.: *See*—
Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., 4,681,045, Cl. 110-345.000.

Cotzas, George M.; VanDusen, Morris V.; and VanSchaick, Thomas E., to General Electric Company. Liquid cooled static excitation system for a dynamoelectric machine. 4,682,068, Cl. 310-198.000.

Council, Buford W., Jr., to Bausch & Lomb Incorporated. Toric lenses, method and apparatus for making same. 4,680,998, Cl. 82-1.00C.

Courtney, Jack W.: *See*—
Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.

Courtney, William L. Combined life vest device and buoyancy compensator. 4,681,552, Cl. 441-92.000.

Coussau, Jean: *See*—
Crespin, Gerard; and Coussau, Jean, 4,681,495, Cl. 411-298.000.

Cramer, Hans, to H. Krantz GmbH & Co. Link chain, especially a tentering chain. 4,680,839, Cl. 26-89.000.

Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., to Rexnord Inc. Drive system for belt press. 4,681,033, Cl. 100-118.000.

Crawford, Wheeler C.: *See*—
Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.

Credle, William S., Jr., to Coca-Cola Company, The. Single-acting, gas operated pump. 4,681,518, Cl. 417-395.000.

Creedon, Richard L., to GA Technologies Inc. Rail gun barrel with axially prestressed insulators. 4,681,015, Cl. 89-8.000.

Creedon, Richard L., to GA Technologies Inc. Rail gun barrel with gas containment means. 4,681,016, Cl. 89-8.000.

Crespin, Gerard; and Coussau, Jean, to Framatome & Cie. Device and process for fixing two parts with a captive screw. 4,681,495, Cl. 411-298.000.

Crockatt, William B.; and Rimma, John, to DeSoto, Inc. Aqueous water-repellent coatings. 4,681,910, Cl. 524-487.000.

Cromer, Charles J. Freeze protection valve for solar heaters. 4,681,088, Cl. 126-420.000.

Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., to Motorola, Inc. Apparatus for polishing semiconductor wafers. 4,680,893, Cl. 51-5.00R.

Crosbie, Donald A. Apparatus and method of shoring masonry, stone, concrete and other materials over openings in buildings. 4,681,290, Cl. 248-225.310.

Crounse, Kim H.; and Archibald, James B., to General Electric Company. Coolant gas flow separator baffle for a dynamoelectric machine. 4,682,064, Cl. 310-61.000.

Crowe, William E., to Hughes Tool Company. Rotary power slips. 4,681,193, Cl. 188-67.000.

Crowell, Douglas H.: *See*—
Simmonds, Robert C., Jr.; Crowell, Douglas H.; and Martin, John F., 4,681,650, Cl. 156-378.000.

Crowley, Michael S., to Amoco Corporation. Refractory anchor. 4,680,908, Cl. 52-378.000.

Crueger, Wulf: *See*—
Egerer, Peter; Crueger, Wulf; and Golker, Christian, 4,681,843, Cl. 435-41.000.

Crystal, Anthony A.: *See*—
Rummel, Raymond W.; and Crystal, Anthony A., 4,680,948, Cl. 68-3.00R.

Cucci, Gerald R.; and Peterson, Thomas P., to Rosemount Inc. Isolating mount for external vibration sensitive sensor. 4,681,293, Cl. 248-603.000.

Cuervo, Armando A. Method and apparatus for therapeutic motion and sound treatment of infants. 4,681,096, Cl. 128-33.000.

Cuiper, Glen H., to Hughes Tool Company. Internal nonrotating tieback connector. 4,681,166, Cl. 166-345.000.

Culross, Claude C.: *See*—
Singhal, Gopal H.; and Culross, Claude C., 4,681,957, Cl. 556-38.000.

Cummins Engine Company, Inc.: *See*—
Kubo, Isoroku, 4,681,326, Cl. 277-27.000.

Cuppen, Johannes J. M., to U.S. Philips Corporation. Method and device for determining an NMR distribution in a region of a body. 4,682,109, Cl. 324-309.000.

Currie, Janie K.: *See*—
Desmond, Michael J.; Currie, Janie K.; and Pesa, Frederick A., 4,681,747, Cl. 423-277.000.

Curro, John J.: *See*—
Linman, E. Kelly; Curro, John J.; and Weinshenker, Eugene, 4,681,793, Cl. 428-138.000.

Cyr, John F. Adapter system for marine auto pilot. 4,681,055, Cl. 114-144.00E.

d'Agostino, Guy; Dhainaut, Andre; Kettler, Daniel G. A.; and Leclerc, Henry R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Compound seal with pressure equalization aperture. 4,681,327, Cl. 277-29.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.

Daicel Chemical Industries, Ltd.: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,681,919, Cl. 525-292.000.

Daikin Industries Ltd.: *See*—
Hisamoto, Iwao; and Yamana, Masayuki, 4,681,974, Cl. 560-87.000.

Daimler-Benz Aktiengesellschaft: *See*—
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Hatayama, Fumihiro, 4,682,243, Cl. 358-287.000.
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.
Yamada, Mitsuhiko, 4,682,286, Cl. 364-200.000.

d'Alayer de Costemore d'Arc, Stephane A. M., to Staar S. A. Power-operated device for assisting loading and unloading a disc player. 4,682,320, Cl. 369-77.100.

Dallman, Ernest R. Access door system. 4,681,044, Cl. 109-24.100.

Daloia, Gaetan: *See*—
Andre, Guy; Gollin, Robert; and Daloia, Gaetan, 4,680,834, Cl. 24-16.0PB.

Dalton, Michael J. Peritoneal catheter. 4,681,570, Cl. 604-282.000.

d'Andrea, Giacomo: *See*—
Ruelle, Jean-Jacques; d'Andrea, Giacomo; and Asselberghs, Leopold, 4,680,958, Cl. 73-56.000.

Danfoss A/S: *See*—
Petersen, Jorgen H.; and Clausen, Peter J. M., 4,681,533, Cl. 431-208.000.
Simonsen, Jens K.; and Moos, Hans J., 4,680,974, Cl. 73-861.380.

Danieli, Diego, to Calzaturificio F.lli Danieli S.p.A. Diversifiable compliance sole structure. 4,680,875, Cl. 36-31.000.

Danielli, Franco; and Solaroli, Sergio, to Finike Italiana Marposs S.p.A. Apparatus for checking linear dimensions. 4,680,865, Cl. 33-143.00L.

Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., to United States of America, National Aeronautics and Space Administration. Method for machining holes in composite materials. 4,680,897, Cl. 51-281.00R.

Darr, Robert E.: *See*—
Mojden, Wallace W.; and Darr, Robert E., 4,681,507, Cl. 414-786.000.

Dart Industries Inc.: *See*—
Kruger, Kurt J.; and Miller, Lester, 4,681,385, Cl. 439-252.000.

Daughtery, Denny E.: *See*—
Bruegge, Anthony J.; and Daughtery, Denny E., 4,681,696, Cl. 252-99.000.

Dave, Timothy A.; and Guch, Steve, Jr., to GTE Government Systems Corporation. Apparatus for and method of extracting an output beam from a laser system. 4,682,340, Cl. 372-108.000.

Davey Company, The: *See*—
Dodd, Stephen C., 4,680,957, Cl. 73-55.000.

David, Morgan W. A.; and Hedley, David J., to Sony Corporation. Video signal processing. 4,682,217, Cl. 358-89.000.

Davidson, Robert J., to Hewlett Packard Company. Interferometer apparatus and method for determining the spatial relationship of two or more objects. 4,681,447, Cl. 356-351.000.

Davies, Gordon I.: *See*—
Jenkins, Walter N.; and Davies, Gordon I., 4,681,258, Cl. 239-66.000.

Davies, Nigel C.; and Sheasby, Peter G., to Alcan International Limited. Anodic aluminium oxide film and method of forming it. 4,681,668, Cl. 204-28.000.

Davis, Larry: *See*—
Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., 4,681,879, Cl. 514-211.000.

Davis, Richard A.; and Davis, Wilfrid E. Decorative wall covering. 4,680,911, Cl. 52-521.000.

Davis, Robert J., to American Davidson, Inc. Variable inlet fan assembly. 4,681,509, Cl. 415-161.000.

Davis, Walter L., to Motorola, Inc. Apparatus for inhibiting repetitive message detections in a zone batched communication system. 4,682,165, Cl. 340-825.500.

Davis, Wilfrid E.: *See*—
Davis, Richard A.; and Davis, Wilfrid E., 4,680,911, Cl. 52-521.000.

Davison, Keith K., to Personics Corporation. Apparatus and method for controlling a cursor on a computer display. 4,682,159, Cl. 340-709.000.

Dawans, Francois: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.

Dawson, Brian D.; and Leacock, James R., to Emhart Industries, Inc. Life safety audio system having a voice synthesizer and a constant volume telephone network. 4,682,348, Cl. 379-37.000.

Day, John P.: *See*—
DeAngelis, Thomas P.; and Day, John P., 4,681,624, Cl. 75-28.000.

DeAngelis, Thomas P.; and Day, John P., to Corning Glass Works. Method of filtering molten metals using a monolithic refractory honeycomb filter. 4,681,624, Cl. 75-28.000.

Decker, Oscar C., Jr.; and Kleemann, Eugene. Tire deflation mechanism. 4,681,148, Cl. 152-431.000.

Deckert, Clinton; and Wilson, Larry L., to Centaur Sciences, Inc. Flow control system. 4,681,563, Cl. 604-67.000.

DeCloux, Richard J. Phasing system for exercise stair. 4,681,316, Cl. 272-130.000.

Dedole, Pascal; and Laurent, Jean, to Institut Francais du Petrole. Device for generating acoustic pulses by implosion, inside a well. 4,682,309, Cl. 367-146.000.

Deere & Company: *See*—
Kryscyk, Robert, 4,681,336, Cl. 280-482.000.
Poore, Bernard B., 4,681,073, Cl. 123-206.000.

DeFreitas, Richard E.; and Sullivan, Daniel T., to Analog and Digital Systems, Inc. Generating narrowly-separated variable-frequency clock signals. 4,682,362, Cl. 381-61.000.

Degussa Aktiengesellschaft: *See*—
Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, 4,681,735, Cl. 420-464.000.
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.

Degussa Electronics Inc.: *See*—
Hunt, Charles D'A., 4,681,787, Cl. 428-577.000.

Dehem, Paul R.: *See*—
Stelma, Michael J.; and Dehem, Paul R., 4,681,012, Cl. 84-422.00S.

Dehydro Corporation, The: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,681,689, Cl. 210-784.000.

Dejneka, Tamara: *See*—
Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., 4,681,937, Cl. 540-355.000.

Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, to Prima Progetti S.p.A. Method of laser welding sheet metal protected by low-vaporizing-temperature materials. 4,682,002, Cl. 219-121.0LD.

Delons, Luc; and Chaumont, Roger, to Elf France. Device for the selective and continuous recovery of hydrocarbons present in the form of a sheet at the surface of an aqueous medium. 4,681,680, Cl. 210-110.000.

Delta International Machinery Corp.: *See*—
Miller, David, 4,681,006, Cl. 83-782.000.

De Luca, Paul V.: *See*—
Hung, Peter; and De Luca, Paul V., 4,681,383, Cl. 439-135.000.

DeLuca, Robert D.; and Forbes-Jones, Robin M., to Johnson & Johnson Dental Products, Company. Crystalline alumina composites. 4,681,538, Cl. 433-9.000.

Del Val, Sagrario M.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Demeyer, Pierre, to Gerin, Merlin. Circuit breaker with digital solid-state trip unit fitted with a calibration circuit. 4,682,264, Cl. 361-96.000.

Demmer, Christopher G.; and Irving, Edward, to Ciba-Geigy Corporation. Modified quinone-diazide group-containing phenolic novolak resins. 4,681,923, Cl. 525-504.000.

DeNardis, Nicholas F. Circuitry for testing generator output. 4,682,103, Cl. 324-158.0MG.

den Boef, Johannes H., to U.S. Philips Corporation. Method of reducing artefacts in images formed by means of fourier zeugmatography. 4,682,110, Cl. 324-309.000.

Dentsply Research & Development Corp.: *See*—
Monroy, Enrique A., 4,681,543, Cl. 433-196.000.

DeRiso, Cheryl: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Derrico, Gerard G., to Dynapert-HTC Corporation. Vapor phase processing machine. 4,681,250, Cl. 228-37.000.

Derrien, Michel: *See*—
Veaux, Jacques; and Derrien, Michel, 4,681,284, Cl. 244-102.00R.

Desmond, Michael J.; Currie, Janie K.; and Pesa, Frederick A., to Standard Oil Company, The. The Process for the preparation of metallosilicates of tetravalent lanthanide and actinide series metals using heterpoly metallates. 4,681,747, Cl. 423-277.000.

DeSoto, Inc.: *See*—
Crockatt, William B.; and Rimma, John, 4,681,910, Cl. 524-487.000.

Despeyroux, Bertrand: *See*—
Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., 4,681,707, Cl. 260-410.90R.

Detloff, John C., to A-1 Security Manufacturing Corp. Apparatus for disassembling locks. 4,680,860, Cl. 29-804.000.

Devoy, James M., to Eastman Kodak Company. Apparatus for producing interleaved copy sheets. 4,681,428, Cl. 355-3.0SH.

Dewhirst, Keith, to Spirax Sarco Limited. Thermostatic steam traps. 4,681,256, Cl. 236-56.000.

Dewitt, Elmer J.: *See*—
Li, George S.; Wu, Muyen M.; and Dewitt, Elmer J., 4,681,917, Cl. 525-210.000.
Wu, Muyen M.; Li, George S.; and Dewitt, Elmer J., 4,681,916, Cl. 525-210.000.

Dhainaut, Andre : *See*—
d'Agostino, Guy; Dhainaut, Andre ; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.

Dianne Eastman Revocable Trust: *See*—
Eastman, Dianne, 4,681,574, Cl. 604-344.000.

Diasonics, Inc.: *See*—
Boner, James C.; Berger, Mitchel S.; and Fine, Marc, 4,681,103, Cl. 128-303.00B.

Diaz-Noriega, Jose M. Miniature plug in fuse. 4,682,140, Cl. 337-260.000.

Dic-Hercules Chemicals, Inc.: *See*—
Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, 4,681,909, Cl. 524-272.000.

Didenot, Dominique: *See*—
Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, 4,681,740, Cl. 422-78.000.

Diehl, Volker: *See*—
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.

Diekman, Robert L., to Huffy Corporation. Apparatus for assembling a bicycle frame. 4,680,849, Cl. 29-252.000.

Diepeveen, Neal; and Bastian, Robert E., to Magnavox Government and Industrial Electronics Company. Stereoscopic infrared imager having a time-shared detector array. 4,682,029, Cl. 250-330.000.

Dieter Grasslin Feinwerktechnik: *See*—
Kammerer, Gerd, 4,681,254, Cl. 236-42.000.

Dietsche, Thomas J.: *See*—
Humphreys, Paula L.; and Dietsche, Thomas J., 4,681,945, Cl. 546-345.000.

Dima, Attila F.: *See*—
Katz, Carlos; Dima, Attila F.; and Eager, George S., Jr., 4,681,985, Cl. 174-73.00R.

Dinse, Wilhelm. Apparatus for the safety stoppage of mechanically moved tools, particularly automatic welding guns. 4,681,202, Cl. 192-129.00A.

Dipl.-Ing. A. Loedige GmbH: *See*—
Lodige, Rudolf; Leonhard, Bernhard; and Stille, Volker, 4,681,211, Cl. 198-789.000.

Discovision Associates: *See*—
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,682,246, Cl. 358-335.000.

Disher, Brennan C.; and Tate, Steven H., to Texaco Inc. Method and apparatus for drilling a group of subsea wells. 4,681,173, Cl. 175-7.000.

Dissosway, Marc A.: *See*—
Childress, Jeffery S.; Dissosway, Marc A.; and Hughes, Houston H., III, 4,682,367, Cl. 455-17.000.

Divo, Michael, to Procter & Gamble Company, The. Bleach compositions. 4,681,695, Cl. 252-94.000.

Djobadze, Michael O.: *See*—
Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., 4,681,651, Cl. 156-382.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Goerich, Hans-Jurgen, 4,681,342, Cl. 280-690.000.

Dodd, Stephen C., to Davey Company, The. Non-invasive, in-line consistency measurement of a non-newtonian fluid. 4,680,957, Cl. 73-55.000.

Dodt, Hans-Walter, to Carl Schenck AG. Test stand for power plants and method. 4,680,975, Cl. 73-862.090.

Doerr, Erwin; and Wood, Prentice J., to Mead Corporation, The. Carrying handle for can carton. 4,681,252, Cl. 229-52.00B.

Doetsch, Werner; and Siegel, Rudolf, to Kali-Chemie Aktiengesellschaft. Process for producing solid aluminum chloride compositions. 4,681,697, Cl. 252-175.000.

Doetsch, Werner; and Siegel, Rudolf, to Peroxid-Chemie GmbH. Superoxidized sodium perborate. 4,681,748, Cl. 423-279.000.

Dohi, Takashi: *See*—
Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.

Doi, Isao: *See*—
Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,681,825, Cl. 430-57.000.

Doi, Nobukazu: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.

Dokiya, Masayuki: *See*—
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.

Dollison, William W., to Otis Engineering Corporation. Hydraulic control circuit and valve assembly. 4,680,930, Cl. 60-375.000.

Dominiani, Frank J., Jr.: *See*—
Annarelli, Dennis C.; and Dominiani, Frank J., Jr., 4,681,964, Cl. 558-112.000.

Don Gilbert Industries, Inc.: *See*—
Bowman, Norman E., 4,682,147, Cl. 340-286.00R.

Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., to G. D. Searle & Co. Intermediate for thiol based collagenase inhibitors. 4,681,966, Cl. 558-255.000.

Doncer, Alex J.: *See*—
White, Harold R.; and Doncer, Alex J., 4,681,682, Cl. 210-221.200.

Donovan, James G.; and Skelton, John, to Albany International Corp. Thermal insulator comprised of split and opened fibers and method for making same. 4,681,789, Cl. 428-93.000.

Donovan, William J., to Honeywell Inc. MOSFET transistor switch control. 4,682,061, Cl. 307-571.000.

Donsco Incorporated: *See*—
Swengel, Robert C., Sr., 4,681,314, Cl. 272-52.000.

Dornier System GmbH: *See*—
Obkircher, Bernt, 4,681,599, Cl. 48-92.000.

Dorr-Oliver Inc.: *See*—
Sutton, Paul M.; and Peplinski, Joseph, 4,681,685, Cl. 210-618.000.

Dosch, Robert G.: *See*—
Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., 4,681,717, Cl. 264-61.000.

Douaud, Andre : *See*—
Goldenberg, Emanuel; and Douaud, Andre , 4,682,293, Cl. 364-431.050.

Douglas, Donald J., to MDS Health Group Limited. Method and apparatus having RF biasing for sampling a plasma into a vacuum chamber. 4,682,026, Cl. 250-288.000.

Doutsbo, Nobuhide, to Sanyo Electric Co., Ltd. Tape speed determining apparatus for video signal reproducing apparatus. 4,682,247, Cl. 360-10.200.

Dow Chemical Company, The: *See*—
Adaway, Timothy J., 4,681,941, Cl. 546-302.000.
Humphreys, Paula L.; and Dietsche, Thomas J., 4,681,945, Cl. 546-345.000.
Park, Chung P.; and Garcia, Gerald A., 4,681,715, Cl. 264-53.000.
Whitten, Charles E.; and Pews, R. Garth, 4,681,943, Cl. 546-306.000.

Dow Corning Corporation: *See*—
Broderick, Dennis W.; and Vincent, Harold L., 4,681,908, Cl. 524-268.000.
Bujalski, Duane R., 4,681,860, Cl. 501-88.000.
Lefler, Harold V., III, 4,681,808, Cl. 428-425.500.
Lopes, William J.; and Klosowski, Jerome M., 4,681,714, Cl. 264-46.600.

Dowbenko, Rostyslaw: *See*—
Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.

Dowell Schlumberger Incorporated: *See*—
Bannister, Charles E., 4,681,165, Cl. 166-312.000.

Dowling, Edward C.: *See*—
Chang, Paul S.; and Dowling, Edward C., 4,682,168, Cl. 340-825.650.

Downing, Philip A., to TRW Cam Gears Limited. Rack and pinion gear and a method of assembling such a gear. 4,680,981, Cl. 74-422.000.

Downs, Kenneth L.: *See*—
Barito, Robert W.; and Downs, Kenneth L., 4,681,788, Cl. 428-68.000.

Doyle, Brent R., to Harris Corporation. Circuit design technique to prevent current hogging when minimizing interconnect stripes by paralleling STL or ISL gate inputs. 4,682,057, Cl. 307-459.000.

Dozsa, Otto L., to USG Corporation. Accelerator for gypsum plaster and process of manufacture. 4,681,644, Cl. 156-39.000.

Dragerwerk Aktiengesellschaft: *See*—
Holscher, Uvo, 4,681,115, Cl. 128-635.000.
Koch, Joachim, 4,681,090, Cl. 128-1.00B.

Dragoo, Jerry L.: *See*—
Reising, George S.; and Dragoo, Jerry L., 4,681,580, Cl. 604-385.00A.

Drapeau, Donald F.; Moore, Benjamin N.; and Hall, Henry B., to Safeway Products, Inc. In-line electric heater for an aerosol delivery system. 4,682,010, Cl. 219-381.000.

Dresser Industries, Inc.: *See*—
Fineberg, Douglas H., 4,681,160, Cl. 166-212.000.
Pennison, Robert A.; and Eckman, Richard E., 4,681,490, Cl. 408-10.000.

Drori, Mordeki. Grooved filter discs. 4,681,681, Cl. 210-133.000.

Drost, Kerry P. Cable driven spa thermostat controller. 4,681,255, Cl. 236-51.000.

Drugge, Folke N. Apparatus for removing manhole covers and the like. 4,681,300, Cl. 254-131.000.

Drummond, Todd: *See*—
Vees, Frederick; and Drummond, Todd, 4,681,049, Cl. 112-262.300.

Dubrowsky, Leonard: *See*—
Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, 4,682,126, Cl. 333-81.00B.

Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, to Automobiles Citroen; and Automobiles Peugeot. Electric energy distributing devices comprising microprocessors. 4,682,294, Cl. 364-492.000.

Duchin, Daniel, to Monarch Marking Systems, Inc. Tag dispensing and attaching method and apparatus. 4,681,248, Cl. 227-73.000.

Du Corday, Gerard M. Periodical hanging system and apparatus. 4,681,232, Cl. 211-46.000.

Ducret, Bernard: *See*—
Geisen, Pierre; Reillaudoux, Jean-Claude; and Ducret, Bernard, 4,680,913, Cl. 52-746.000.

Duffy, Thomas F. Hand saws. 4,680,863, Cl. 30-511.000.

Dumas, Theodore A.; and Griffee, Leslie V., to Rockwell International Corporation. Flush mounted tacan base station antenna apparatus. 4,682,181, Cl. 343-789.000.

Dumschat, Helmut: *See*—
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.

Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., to BP Chemicals Limited. Flame retardant phenolic foams. 4,681,902, Cl. 521-85.000.

Dunlop Limited: *See*—
Atkin, Howard S.; and Forth, Geoffrey A., 4,681,377, Cl. 305-35.0EB.

Dunnebacke, Joachim A., to U.S. Philips Corporation. Fader circuit arrangement in electrical reproducing apparatus and fader control for such an arrangement. 4,682,364, Cl. 381-109.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bach, David T.; Gruenke, Roger A.; and Levin, Herman W., 4,681,443, Cl. 356-246.000.
Bakermans, Frank C.; and Trexler, Charles J., 4,682,129, Cl. 333-184.000.
Gosser, Lawrence W., 4,681,751, Cl. 423-584.000.
Larson, James R.; and Trout, Torence J., 4,681,831, Cl. 430-114.000.
Rutkiewic, Andrew F.; and Strolle, Clifford H., 4,681,815, Cl. 428-458.000.
Webster, Owen W., 4,681,918, Cl. 525-282.000.

Duracell Inc.: *See*—
Graham, Teresita O.; and Goodman, John T., 4,681,698, Cl. 252-182.100.

Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, to Institut Francais du Petrole. Process for manufacturing inverse microlatices of watersoluble copolymers, the resultant inverse microlatices and their use for improving the production of hydrocarbons. 4,681,912, Cl. 524-827.000.

Durbin, Enoch J. Fluid flow rate and direction measuring apparatus. 4,680,962, Cl. 73-189.000.

Durham, Stephen J., to Cermetek Microelectronics, Inc. Universal modem receiver transmitter. 4,682,352, Cl. 379-98.000.

Durston, Thomas W.: *See*—
Faith, Richard W.; and Durston, Thomas W., 4,682,346, Cl. 379-22.000.

Duruz, Jean-Jacques, to ELTECH Systems Corporation. Low temperature alumina electrolysis. 4,681,671, Cl. 204-67.000.

Duurland, Jozef M.; Bos, Sinnighe J.; and Kreeft, Hendrik K., to Polygram International Holding B.V. Magnetic-tape cassette with stretched liner arrangement. 4,681,280, Cl. 242-199.000.

Duyckinck, Robert W.: *See*—
Heidinger, Alfred J.; and Duyckinck, Robert W., 4,681,676, Cl. 209-380.000.

Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., to William F. Cosulich Associates, P.C. Treatment of flue gas containing noxious gases. 4,681,045, Cl. 110-345.000.

Dvorak, Robert F.; Netolicky, Charles E.; and Palmer, Neil R., to Square D Company. Button indicator and switch assembly. 4,681,061, Cl. 116-279.000.

Dyer, Paul N.; Pierantozzi, Ronald; and Withers, Howard P., to Air Products and Chemicals, Inc. Supported fischer-tropsch catalyst and method of making the catalyst. 4,681,867, Cl. 502-242.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Engels, Hans-Werner; Neuschaffer, Karlheinz; and Spielau, Paul, 4,681,631, Cl. 106-4.000.
Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoffl, Rainer, 4,681,017, Cl. 89-29.000.

Dynapert-HTC Corporation: *See*—
Derrico, Gerard G., 4,681,250, Cl. 228-37.000.

Dynavac, Inc.: *See*—
Leisman, Thomas; and Huston, Jon, 4,681,186, Cl. 182-47.000.

Dynisco, Inc.: *See*—
Wareham, William, 4,680,972, Cl. 73-730.000.

E.A.S. Technologies, Inc.: *See*—
Fearon, Edward R.; and Fearon, Robert E., 4,682,154, Cl. 340-572.000.

E.I. Du Pont de Nemours and Company: *See*—
Chang, Ike Y., 4,681,911, Cl. 524-607.000.

E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; and Sprague, Peter W., 4,681,886, Cl. 514-259.000.
Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., 4,681,937, Cl. 540-355.000.

Eager, George S., Jr.: *See*—
Katz, Carlos; Dima, Attila F.; and Eager, George S., Jr., 4,681,985, Cl. 174-73.00R.

East, Gary P.: *See*—
Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, 4,681,560, Cl. 604-9.000.

Eastman, Dianne, to Dianne Eastman Revocable Trust. Ostomy appliance with flexible membrane connector. 4,681,574, Cl. 604-344.000.

Eastman Kodak Company: *See—*
Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, 4,681,828, Cl. 430-97.000.
Devoy, James M., 4,681,428, Cl. 355-3.0SH.
Eaton, Brian J.: *See—*
Coates, Philip V.; and Eaton, Brian J., 4,682,229, Cl. 358-166.000.
Eaton, John M. Method and apparatus for aeration of wastewater lagoons. 4,681,711, Cl. 261-91.000.
Ebara, Ryohei; and Sano, Shin-ichi, to Somar Corporation. Lightsafe masking film. 4,681,784, Cl. 428-40.000.
Ebaugh, Paul L.: *See—*
Masters, Edwin J.; and Ebaugh, Paul L., 4,681,567, Cl. 604-198.000.
Eberl, Tertulin; and Weber-Unger, Georg, to Anita-Spezialmiederfabrik Dr. Helbig & Co. Mastoprosthesis. 4,681,587, Cl. 623-7.000.
Eberle, Rudolf; Essert, Wilfried; and Kull, Herbert, to Juwedor GmbH. Process for producing pieces of jewelry from precious metals and pieces of jewelry produced by it. 4,681,664, Cl. 204-9.000.
Eckman, Richard E.: *See—*
Pennison, Robert A.; and Eckman, Richard E., 4,681,490, Cl. 408-10.000.
Ecodyne Limited: *See—*
Lindstol, Anders, deceased, 4,681,683, Cl. 210-521.000.
Ecolab Inc.: *See—*
Olson, Keith E.; and Brittain, Kent R., 4,681,914, Cl. 252-91.000.
Edelman, William, to Shiley Inc. Apparatus for focusing an intravascular laser catheter. 4,681,104, Cl. 128-303.100.
Edwards, Grant C.; Gilson, Jean-Pierre; and McDaniel, Carl V., to W. R. Grace & Co. Cracking catalyst. 4,681,864, Cl. 502-63.000.
Edwards, James A.: *See—*
Edwards, Samuel H.; and Edwards, James A., 4,681,501, Cl. 414-42.000.
Edwards, Samuel H.; and Edwards, James A. Article transfer apparatus. 4,681,501, Cl. 414-42.000.
Efamol Limited: *See—*
Horrobin, David F., 4,681,896, Cl. 514-552.000.
Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., to Hoechst-Roussel Pharmaceuticals Inc. 11-substituted 5H,11H-pyrrolo[2,1-c][1,4]benzoxazepines as antipsychotic and analgesic agents. 4,681,879, Cl. 514-211.000.
Efron, Edward; McPherson, James O.; and Kim, Young B., to Discovision Associates. Characterizing the information transfer characteristics of a recording medium. 4,682,246, Cl. 358-335.000.
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Coating quality measuring device and method. 4,682,041, Cl. 250-571.000.
Egan, Michael: *See—*
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.
Egerer, Peter; Crueger, Wulf; and Golker, Christian, to Bayer Aktiengesellschaft. Immobilization of cells and enzymes. 4,681,843, Cl. 435-41.000.
Egger, Hans R., to Intradym Maschinen AG. Method of and apparatus for conveying powdered or granular material. 4,681,484, Cl. 406-63.000.
Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, to Fuchs Systemtechnik GmbH. Electric arc furnace. 4,682,341, Cl. 373-99.000.
Eian, Gilbert; and Cheney, Paul G., to Minnesota Mining and Manufacturing Company. Durable melt-blown fibrous sheet material. 4,681,801, Cl. 428-283.000.
Eibeck, Richard E.: *See—*
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.
Eickmann, Karl. Slide bearing portions on outer faces of piston shoes. 4,681,023, Cl. 91-488.000.
Eigenmann, Ludwig. Method for forming roadway-marking means whereby individual retroreflecting elements are gathered and grouped together. 4,681,480, Cl. 404-14.000.
Einhaus, Hermanus F., to U.S. Philips Corporation. Pivoting front cover for a drawer. 4,682,319, Cl. 369-75.200.
Eirich, Hubert: *See—*
Leidel, Dieter S.; Eirich, Hubert; Eirich, Paul; and Eirich, Walter, 4,681,267, Cl. 241-23.000.
Eirich, Paul: *See—*
Leidel, Dieter S.; Eirich, Hubert; Eirich, Paul; and Eirich, Walter, 4,681,267, Cl. 241-23.000.
Eirich, Walter: *See—*
Leidel, Dieter S.; Eirich, Hubert; Eirich, Paul; and Eirich, Walter, 4,681,267, Cl. 241-23.000.
Eisenhandler, Sanford: *See—*
Perlman, Stuart S.; Eisenhandler, Sanford; Lyons, Paul W.; and Shumila, Michael J., 4,682,230, Cl. 358-167.000.
Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, to Xerox Corporation. Gutter for an ink jet printer. 4,682,183, Cl. 346-75.000.
Eldec Corporation: *See—*
Lindsay, Thomas A.; and Morton, Randall E., 4,681,395, Cl. 350-96.160.
Elf France: *See—*
Delons, Luc; and Chaumont, Roger, 4,681,680, Cl. 210-110.000.
Elger, Walter: *See—*
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.
Ellenberger & Poensgen GmbH: *See—*
Sell, William F., 4,682,138, Cl. 337-68.000.
Elman, Boris S.: *See—*
Sandman, Daniel J.; and Elman, Boris S., 4,681,920, Cl. 525-328.100.
Elmlid, Carl-Gustaf: *See—*
Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., 4,681,268, Cl. 241-24.000.
Elscint Ltd.: *See—*
Beer, Steve, 4,682,112, Cl. 324-322.000.
Reuveni, Asher, 4,682,291, Cl. 364-414.000.
Elsenpeter, William R., to Harris Corporation. Adapter for coupling together two subscribers' lines to a telephone test set. 4,682,345, Cl. 379-1.000.
Elsner, Ernst, to J.M. Voith GmbH. Drive unit, particularly for short-haul vehicles. 4,680,986, Cl. 74-866.000.
ELTECH Systems Corporation: *See—*
Duruz, Jean-Jacques, 4,681,671, Cl. 204-67.000.
Elzett Muvek: *See—*
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , 4,682,137, Cl. 335-284.000.
Embrex Inc.: *See—*
Hebrank, John H., 4,681,063, Cl. 119-1.000.
Emerson Electric Co.: *See—*
Mertz, Denny W., 4,681,297, Cl. 251-45.000.
Emhart Industries, Inc.: *See—*
Dawson, Brian D.; and Leacock, James R., 4,682,348, Cl. 379-37.000.
Mussmann, Sara M.; and Kidd, Roy E., 4,682,157, Cl. 340-605.000.
Emi Limited: *See—*
Coates, Philip V.; and Eaton, Brian J., 4,682,229, Cl. 358-166.000.
Emory University: *See—*
Chu, Chung K.; and Schinazi, Raymond F., 4,681,933, Cl. 536-23.000.
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Porous and spherical carbonaceous product. 4,681,764, Cl. 424-125.000.
Endo, Keiji: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.
ENFO Grundlagenforschungs AG: *See—*
Bauer, Friedrich, 4,680,847, Cl. 29-173.000.
Engel, Alan K., to Research Development Corp. of Japan. Ultrathin polymeric imine films and process for making the same. 4,681,799, Cl. 428-220.000.
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Kluth, Daniel J.; and Engel, Gary L., 4,682,329, Cl. 371-15.000.
Engelhardt, Jonathan A. Efficiency photo-gram with stand-up display. 4,681,253, Cl. 229-92.800.
Engelken, Robert D.; and McCloud, Hal E. Method for electroless and vapor deposition of thin films of three tin sulfide phases on conductive and nonconductive substrates. 4,681,777, Cl. 427-87.000.
Engels, Hans-Werner; Neuschaffer, Karlheinz; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Inorganic molding composition containing a lithogenous component. 4,681,631, Cl. 106-4.000.
English, George A.; and Marracino, Charles R., to Nidec-Torin Corporation. Molded plastic motor housing with integral stator mounting and shaft journalling projection. 4,682,065, Cl. 310-90.000.
Enomoto, Masao, to Ichikoh Industries, Ltd. Outside rear view mirror. 4,681,409, Cl. 350-637.000.
Enso-Gutzeit Oy: *See—*
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, 4,681,935, Cl. 536-56.000.
Erdboris, Ulrich: *See—*
Rathert, Horst; Grannemann, Gerhard; and Erdboris, Ulrich, 4,681,500, Cl. 412-33.000.
Erdei, Roland: *See—*
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin, 4,681,453, Cl. 356-394.000.
Esaki, Motoharu: *See—*
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.
Esanu, Andre, to Societe de Conseils de Recherches et d'Applications Scientifiques. Thienopyridine derivatives and anti-thrombotic compositions containing the same. 4,681,888, Cl. 514-301.000.
Esselte Almanacksforlag AB: *See—*
Wiberg, Olle, 4,681,474, Cl. 402-75.000.
Essert, Wilfried: *See—*
Eberle, Rudolf; Essert, Wilfried; and Kull, Herbert, 4,681,664, Cl. 204-9.000.
ETA SA Fabriques d'Ebauches: *See—*
Ray, Claude, 4,681,464, Cl. 368-157.000.
Etzbach, Karl-Heinz, to BASF Aktiengesellschaft. Bisazo dyes and their use in liquid crystalline materials. 4,681,699, Cl. 252-299.100.
Evans, Edward R.: *See—*
Kallin, Fredrik L. N.; and Evans, Edward R., 4,681,468, Cl. 400-120.000.
Evans, Edwin R.; and Torkelson, Arnold, to General Electric Company. Method for preventing premature curing of silicone compositions and compositions made thereby. 4,681,913, Cl. 524-862.000.
Everett, Nicholas P.: *See—*
Paterson, Karol E.; and Everett, Nicholas P., 4,681,849, Cl. 435-240.000.

Everson, Douglas G.: *See*—
Maroschak, Michael D.; Atchley, Frederick P.; and Everson, Douglas G., 4,681,684, Cl. 210-532.200.

Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul, 4,680,894, Cl. 51-50.00R.

Excell Corporation: *See*—
Shimizu, Shoji, 4,681,525, Cl. 425-527.000.

Extrude Hone Corporation: *See*—
Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., 4,681,600, Cl. 51-293.000.

Exxon Production Research Company: *See*—
Chung, Jing-Yau, 4,682,308, Cl. 367-31.000.

Exxon Research & Engineering Co.: *See*—
Gardner, Irwin J.; Fusco, James V.; and Baldwin, Francis P., 4,681,921, Cl. 525-357.000.
Halbert, Thomas R.; and Stiefel, Edward I., 4,681,958, Cl. 556-42.000.
Singhal, Gopal H.; and Culross, Claude C., 4,681,957, Cl. 556-38.000.

F.C.N.s.r.l.: *See*—
Revici, Emanuel, 4,681,753, Cl. 424-10.000.

F. Zimmermann & Co.: *See*—
Zimmermann, Gert, 4,681,204, Cl. 194-317.000.

Fabinski, Walter; and Schaefer, Werner, to Hartmann & Braun AG. Infrared gas analyzer. 4,682,031, Cl. 250-345.000.

Fabricius, Hans-Ake; and Kottgen, Eckart U., to Shanksville Corporation N.V. Process for producing an Interleukin-1 preparation. 4,681,844, Cl. 435-68.000.

Fabris Industrial Manufacturing Limited: *See*—
Fabris, Mario, 4,680,953, Cl. 72-250.000.

Fabris, Mario, to Fabris Industrial Manufacturing Limited. Roller entry guide relating to a rod mill. 4,680,953, Cl. 72-250.000.

Faith, Richard W.; and Durston, Thomas W., to Harris Corporation. Telephone test set. 4,682,346, Cl. 379-22.000.

Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, to United Technologies Corporation. Removable irreversibly shrinking male mandrel. 4,681,724, Cl. 264-257.000.

Falconer, Ralph A., to Jandy Industries. Elastomer ball check valve. 4,681,139, Cl. 137-537.000.

Falguieres, Alain: *See*—
Ozil, Maurice; and Falguieres, Alain, 4,682,285, Cl. 364-200.000.

Fanuc Ltd: *See*—
Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, 4,682,167, Cl. 340-825.230.
Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, 4,681,997, Cl. 219-69.00C.

Farhoomand, Jam: *See*—
Pickett, Herbert M.; and Farhoomand, Jam, 4,682,053, Cl. 307-425.000.

Farley, Harold C.; and Boles, Robert G., to Lockheed Corporation. Rotary launcher system for an aircraft. 4,681,013, Cl. 89-1.815.

Farmland Industries, Corporation: *See*—
Spangler, Harvey D.; and Lamb, Kenneth V., 4,681,603, Cl. 55-27.000.

Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, to Ciba-Geigy Corporation. Process and compositions for protecting keratinous material from attack by pests that feed on keratin, and novel esters. 4,681,593, Cl. 8-128.00R.

Farrall, George A.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,680,840, Cl. 29-25.350.

Fasco Industries, Inc.: *See*—
Ivey, Charles W., 4,681,024, Cl. 98-34.600.

Fasolino, Gabriel V. Reusable and adjustable fastener for use with power tool applicator. 4,681,496, Cl. 411-361.000.

Fathman, C. Garrison, to Leland Stanford Junior University, The Board of Trustees of the. Method of conferring immunotolerance to a specific antigen. 4,681,760, Cl. 424-85.000.

Fayter, Richard G., Jr.: *See*—
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,681,703, Cl. 252-522.00R.

Fazlin, Fazal A. Multi-layer printed circuit board vacuum lamination method. 4,681,649, Cl. 156-285.000.

Fearon, Edward R.; and Fearon, Robert E., to E.A.S. Technologies, Inc. Label for use in anti-theft surveillance system. 4,682,154, Cl. 340-572.000.

Fearon, Robert E.: *See*—
Fearon, Edward R.; and Fearon, Robert E., 4,682,154, Cl. 340-572.000.

Feazel, Charles T., to Phillips Petroleum Company. Geochemical oil prospecting method using in situ simulation of diagenetic processes. 4,681,854, Cl. 436-31.000.

Feinauer, Otto: *See*—
Schneider, Franz; Braitinger, Helmut; and Feinauer, Otto, 4,682,280, Cl. 364-191.000.

Feldewert, Herbert, to Wilhelm Hegenscheidt GmbH. Material saving method for truing track wheels. 4,680,846, Cl. 29-168.000.

Feliz, Jack M. Champagne bottle opener. 4,680,993, Cl. 81-3.370.

Fellers, Christer; Htun, Myat; and Hansson, Torbjorn, to Flakt AB. Method for controlling shrinkage and/or stretching of a paper web in the drying section of paper machine, in the form of a cylinder drier and/or fan dryer, transversely to the feed direction of the web and arrangements for carrying out the method. 4,680,873, Cl. 34-116.000.

Fenske, Steven L.: *See*—
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., to Strato Medical Corporation. Infusion device. 4,681,566, Cl. 604-135.000.

Ferber, Alan C.; and Chamran, Morteza M., deceased (by Chamran, Delories M., legal representative), to Perkin-Elmer Corporation, The. Automatic wavelength calibration apparatus. 4,681,444, Cl. 356-318.000.

Fernandez, Maria I. M.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Ferranti, plc: *See*—
Mallinson, Andrew M.; and Hoodless, Adrian H. W., 4,682,086, Cl. 315-371.000.

Figgie International Inc.: *See*—
Mitchell, Hal D.; and Walker, Donald R., 4,680,814, Cl. 2-2.000.

Fine, Marc: *See*—
Boner, James C.; Berger, Mitchel S.; and Fine, Marc, 4,681,103, Cl. 128-303.00B.

Fineberg, Douglas H., to Dresser Industries, Inc. Apparatus for securing a measurement-while-drilling (MWD) instrument within a pipe. 4,681,160, Cl. 166-212.000.

Finike Italiana Marposs S.p.A.: *See*—
Danielli, Franco; and Solaroli, Sergio, 4,680,865, Cl. 33-143.00L.

Fink, Hans, to Bata Schuh AG. Shoe insole. 4,680,877, Cl. 36-44.000.

Finter, Jurgen: *See*—
Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, 4,681,950, Cl. 549-27.000.

Firestone Tire & Rubber Company, The: *See*—
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoffl, Rainer, to Dynamit Nobel Aktiengesellschaft. Practice ammunition system. 4,681,017, Cl. 89-29.000.

Fischer, Walter. Invisible connection for faced parts, in particular for furniture. 4,681,477, Cl. 403-298.000.

Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, to Ciba-Geigy Corporation. Thioxanthone derivatives. 4,681,950, Cl. 549-27.000.

Fitts, Robert W., to RCA Corporation. Header assembly for an intensified charge coupled image sensor. 4,682,021, Cl. 250-213.0VT.

Fitzpatrick, Paul, to Ex-Cell-O Corporation. Fixture for honing thin wall gear parts. 4,680,894, Cl. 51-50.00R.

Flakt AB: *See*—
Fellers, Christer; Htun, Myat; and Hansson, Torbjorn, 4,680,873, Cl. 34-116.000.

Fleetwood Systems, Inc.: *See*—
Mojden, Wallace W.; and Darr, Robert E., 4,681,507, Cl. 414-786.000.

Flerlage, Horst: *See*—
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, 4,682,274, Cl. 362-61.000.

Fletcher, Lawrence: *See*—
Ulriksson, Bengt A.; and Fletcher, Lawrence, 4,682,060, Cl. 307-543.000.

Flight Equipment and Engineering Limited: *See*—
Simpson, Leslie J., 4,681,369, Cl. 297-316.000.

Flonc, Nicholas P.: *See*—
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.

Floordress Reinigungsgeraete: *See*—
Schunter, Roland, 4,680,826, Cl. 15-147.00R.

Flor, James E.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Florin, Gerd: *See*—
Bartesch, Helmut; and Florin, Gerd, 4,681,029, Cl. 99-483.000.

Flowers, John E.; Romanowski, Christopher A.; and Smith, Dennis M., to Hunter Engineering Company, Inc. Continuous casting aluminum alloy. 4,681,152, Cl. 164-477.000.

Flygt Aktiebolag: *See*—
Stahl, Torvald, 4,682,069, Cl. 310-261.000.

Flynn, Charles J.: *See*—
Sanders, Robert E.; Flynn, Charles J.; and Vertreese, John L., 4,682,079, Cl. 315-186.000.

FMC Corporation: *See*—
Annarelli, Dennis C.; and Dominiani, Frank J., Jr., 4,681,964, Cl. 558-112.000.

Focke & Co.: *See*—
Focke, Heinz, 4,682,038, Cl. 250-548.000.

Focke, Heinz, to Focke & Co. Arrangement for monitoring and controlling webs in packaging machines. 4,682,038, Cl. 250-548.000.

Fong, James J., to Minnesota Mining and Manufacturing Company. Treating composition containing fluorochemical compound mixture and textiles treated therewith. 4,681,790, Cl. 428-96.000.

Forbes-Jones, Robin M.: *See*—
DeLuca, Robert D.; and Forbes-Jones, Robin M., 4,681,538, Cl. 433-9.000.

Forbes, Richard L., II: *See—*
Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.
Ford Aerospace & Communications Corporation: *See—*
Chism, Samuel B., Jr., 4,682,235, Cl. 358-212.000.
Ford Motor Company: *See—*
Zurilla, Ronald W.; and Huff, John, 4,681,641, Cl. 148-6.15Z.
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, to Enso-Gutzeit Oy. Procedure for recovering soluble carbohydrates contained in wood. 4,681,935, Cl. 536-56.000.
Forster, Hilmar; and Lindner, Harald, to Scharfenbergkupplung GmbH. Elastic articulation of a central buffer coupling for rail vehicles. 4,681,235, Cl. 213-50.000.
Forth, Geoffrey A.: *See—*
Atkin, Howard S.; and Forth, Geoffrey A., 4,681,377, Cl. 305-35.0EB.
Fory, Werner: *See—*
Bohner, Best; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.
Meyer, Willy; and Fory, Werner, 4,681,619, Cl. 71-92.000.
Foster, Donald A., to Polaroid Corporation. Bubble injection dissolved gas measurement method and apparatus. 4,681,601, Cl. 55-18.000.
Foster, Thomas H.: *See—*
Vatis, Dimitrios; Bottomley, Paul A.; and Foster, Thomas H., 4,682,106, Cl. 324-307.000.
Fragema: *See—*
Beuneche, Daniel; Mauvieux, Christian; and Amiet, Pierre, 4,681,730, Cl. 376-252.000.
Framatome & Cie: *See—*
Crespin, Gerard; and Coussau, Jean, 4,681,495, Cl. 411-298.000.
Franek, Jozef T.: *See—*
Uehlinger, Werner H.; and Franek, Jozef T., 4,681,001, Cl. 83-37.000.
Franke, Werner; and Brahm, Richard, to Hoechst Aktiengesellschaft. Organic electrophotographic material sensitized by cyanine dye. 4,681,827, Cl. 430-83.000.
Franz, Gerhard: *See—*
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.
Frederiksen, Jeffrey E. Video transmission system. 4,682,360, Cl. 380-10.000.
Freeman, Richard A.: *See—*
Loper, Roger K.; and Freeman, Richard A., 4,682,123, Cl. 332-16.00R.
Frei, Hans-Peter: *See—*
Schmed, Arthur; and Frei, Hans-Peter, 4,681,028, Cl. 99-289.00R.
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., to Abbott Laboratories. Erythromycin A 11,12-carbonate and method of use. 4,681,872, Cl. 514-29.000.
Freitag, Dieter: *See—*
Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, 4,681,922, Cl. 525-474.000.
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, to Hella KG Hueck & Co. Automotive headlight. 4,682,274, Cl. 362-61.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Arciszewski, Bernhard; and Wiedeck, Hans-Norbert, 4,681,482, Cl. 404-35.000.
Grotkasten, Klaus, 4,681,521, Cl. 425-36.000.
Friedland, David J.: *See—*
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., to Outboard Marine Corporation. Outboard motor extension handle assembly. 4,681,056, Cl. 114-146.000.
Friedman, Harry, III. Automotive indicator system. 4,682,146, Cl. 340-77.000.
Friedmann, Oswald: *See—*
Maucher, Paul; and Friedmann, Oswald, 4,681,199, Cl. 192-70.230.
Friedrich Wilh. Schwing GmbH: *See—*
Schwing, Friedrich, 4,681,022, Cl. 91-471.000.
Friend, Richard H.: *See—*
Berthier, Claude M.; and Friend, Richard H., 4,681,822, Cl. 429-191.000.
Fritschi, Edgar: *See—*
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.
From, Jan O.: *See—*
Sondov, Sten Y.; and From, Jan O., 4,681,688, Cl. 210-770.000.
Frommer, Werner: *See—*
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., to Phillips Petroleum Company. Shaped, flavored articles and method of producing same. 4,681,758, Cl. 424-78.000.
Fuchizawa, Tetsuro: *See—*
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,682,191, Cl. 503-200.000.
Fuchs Systemtechnik GmbH: *See—*
Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, 4,682,341, Cl. 373-99.000.
Fuhr, Werner: *See—*
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Matsui, Fujio, 4,682,097, Cl. 320-64.000.
Miyawaki, Motohisa, 4,680,991, Cl. 74-868.000.
Morimoto, Yoshihiko, 4,680,987, Cl. 74-866.000.
Ohgami, Masaaki, 4,680,990, Cl. 74-868.000.
Oshita, Saiichiro, 4,681,183, Cl. 180-79.100.
Oyama, Fusami; and Takahashi, Akira, 4,681,180, Cl. 180-76.000.
Fuji Photo Film Co., Ltd.: *See—*
Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, 4,681,836, Cl. 430-434.000.
Inuiya, Masafumi; and Tabei, Masatoshi, 4,682,212, Cl. 358-44.000.
Ishikawa, Takatoshi; and Nakazyo, Kiyoshi, 4,681,835, Cl. 430-386.000.
Iwakura, Ken; and Sugiyama, Takekatsu, 4,682,193, Cl. 503-209.000.
Konda, Ryuji, 4,682,203, Cl. 357-51.000.
Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, 4,681,838, Cl. 430-367.000.
Mitsui, Akio; and Ohta, Noboru, 4,681,837, Cl. 430-504.000.
Noguchi, Masaru, 4,681,394, Cl. 350-6.600.
Oishi, Kengo; and Suzuki, Osamu, 4,682,260, Cl. 360-133.000.
Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, 4,681,832, Cl. 430-115.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,682,191, Cl. 503-200.000.
Tamura, Kaoru; and Torii, Shumpeita, 4,681,227, Cl. 206-455.000.
Tanaka, Hirosi; and Nakajima, Nobuyoshi, 4,682,028, Cl. 250-327.200.
Uejima, Atsushi, 4,682,315, Cl. 369-45.000.
Usami, Toshimasa; Tanaka, Toshiharu; and Yoshida, Shohei, 4,682,194, Cl. 503-215.000.
Fuji Photo Optical Co., Ltd.: *See—*
Arakawa, Satoshi, 4,682,219, Cl. 358-98.000.
Sato, Kiyoshi; and Matsui, Nobuo, 4,682,214, Cl. 358-55.000.
Fuji Xerox Co., Ltd.: *See—*
Ishitate, Yoshiyuki, 4,682,244, Cl. 358-287.000.
Fujicar Manu. Co. Ltd.: *See—*
Kutsumura, Shoji; and Isonaga, Touichi, 4,681,662, Cl. 202-270.000.
Fujii, Katsumasa: *See—*
Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, 4,681,099, Cl. 128-204.230.
Fujii, Takayoshi: *See—*
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.
Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, to Canon Kabushiki Kaisha. Camera with motor-driven diaphragm device. 4,681,417, Cl. 354-234.100.
Fujino, Yukio; and Kabaya, Morihiro, to Nishikawa Sangyo Co., Ltd. Bedding incorporating far infrared radiator. 4,680,822, Cl. 5-421.000.
Fujioka, Koichiro: *See—*
Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, 4,681,313, Cl. 271-273.000.
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, to Agency of Industrial Science and Technology. Method of refining aluminum. 4,681,626, Cl. 75-68.00A.
Fujita, Katuyuki: *See—*
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.
Fujita, Yoshiji: *See—*
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.
Fujitsu Limited: *See—*
Akasaki, Hidehiko; and Tsujimura, Takehisa, 4,682,207, Cl. 357-74.000.
Arakawa, Hideki, 4,682,051, Cl. 307-359.000.
Tanizawa, Tetsu, 4,682,202, Cl. 357-45.000.
Fujiwara, Hiromi: *See—*
Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneo, 4,681,856, Cl. 536-53.000.
Fukahori, Hidehiko: *See—*
Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, 4,681,417, Cl. 354-234.100.
Fukakusa, Shinji: *See—*
Wakayama, Naoaki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.
Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Electrophotographic photosensitive member. 4,681,826, Cl. 430-65.000.
Fukishima, Minoru; and Kunishi, Shinsuke, to Molex Incorporated. Electrical connector assembly. 4,681,393, Cl. 439-851.000.
Fukuda Denshi Co., Ltd.: *See—*
Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, 4,681,118, Cl. 128-643.000.
Fukuhara, Masao, to Fukuhara Needle Company, Ltd. Method of manufacturing stamped knitting needles. 4,681,150, Cl. 163-5.000.
Fukuhara Needle Company, Ltd.: *See—*
Fukuhara, Masao, 4,681,150, Cl. 163-5.000.

Fukui Noboru: *See*—
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.

Fukui, Tsugushi: *See*—
Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, 4,681,457, Cl. 366-84.000.

Fukuizumi, Toshiharu: *See*—
Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, 4,681,642, Cl. 148-321.000.

Fukumizu, Shinichi: *See*—
Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, 4,681,457, Cl. 366-84.000.

Fukushima, Isao: *See*—
Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, 4,682,096, Cl. 318-808.000.

Fukushima, Masakazu: *See*—
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.

Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, to Pola Chemical Industries, Inc. Method and apparatus for fusing together the bottom of tubular container formed of synthetic resin. 4,681,645, Cl. 156-73.100.

Fulmer, Keith H.; Peebles, Arthur K.; and Steininger, Hugh D., to Allied Corporation. Control circuit for brake booster vehicular hill holder system. 4,681,196, Cl. 192-3.00H.

Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, to Kawasaki Steel Corporation. Method for detecting phosphorus segregates in metallic material. 4,681,857, Cl. 436-78.000.

Funk, John W.: *See*—
Saint, David H.; and Funk, John W., 4,682,034, Cl. 250-363.00R.

Funyu, Yutaka: *See*—
Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, 4,682,182, Cl. 346-1.100.

Furlong, James J.; and Howe, Dwayne E., to Boeing Company, The. Method of testing and adjusting a picofarad detecto circuit. 4,682,272, Cl. 361-437.000.

Furukawa Co., Ltd.: *See*—
Ohi, Toshio, 4,681,170, Cl. 173-50.000.

Furusho, Takao: *See*—
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Furuya, Akira: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,681,847, Cl. 435-172.300.

Furuya, Tsuneo; and Inazawa, Yoshizumi, to Sony Corporation. Disc player with search noise suppression. 4,682,312, Cl. 369-32.000.

Fusco, James V.: *See*—
Gardner, Irwin J.; Fusco, James V.; and Baldwin, Francis P., 4,681,921, Cl. 525-357.000.

Futa, Kyozo: *See*—
Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyozo, 4,681,075, Cl. 123-339.000.

Futagawa, Toshinobu. Apparatus for driving tapes. 4,681,273, Cl. 242-55.000.

G.B. Boucherie, Firma: *See*—
Boucherie, Leonel, 4,680,850, Cl. 29-426.300.

G. D. Searle & Co.: *See*—
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,681,966, Cl. 558-255.000.
Liang, Chi-Dean, 4,681,970, Cl. 558-408.000.
Mueller, Richard A., 4,681,939, Cl. 540-547.000.

G.F. S.r.l.: *See*—
Gaita, Giorgio, 4,681,350, Cl. 285-315.000.

G. Siempelkamp GmbH & Co.: *See*—
Thelen, Werner, 4,681,523, Cl. 425-168.000.

GA Technologies Inc.: *See*—
Creedon, Richard L., 4,681,015, Cl. 89-8.000.
Creedon, Richard L., 4,681,016, Cl. 89-8.000.
Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., 4,680,936, Cl. 62-45.000.

Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, to PPG Industries, Inc. Treated glass fibers and aqueous dispersion and nonwoven mat of the glass fibers. 4,681,802, Cl. 428-288.000.

Gabor, Andrew, to Xerox Corporation. Quiet impact printer. 4,681,469, Cl. 400-157.200.

Gaita, Giorgio, to G.F. S.r.l. Quick coupling connection for hoses. 4,681,350, Cl. 285-315.000.

Gal, Laszlo V., to Unisys Corporation. Three-state logic circuit for wire-ORing to a data bus. 4,682,058, Cl. 307-473.000.

Galambos, Janos: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Gale, Robert M.; and Berggren, Randall G., to ALZA Corporation. Transdermal delivery system for delivering nitroglycerin at high transdermal fluxes. 4,681,584, Cl. 604-897.000.

Gallaro, Anthony V., to North American Philips Consumer Electronics Corp. CRT with optical window and method. 4,681,775, Cl. 427-64.000.

Galles, Henri: *See*—
Gallet, Patrick; and Galles, Henri, 4,681,343, Cl. 280-699.000.

Gallet, Patrick; and Galles, Henri, to Regie Nationale Des Usines Renault. Rear axle assembly for suspension of motor vehicles. 4,681,343, Cl. 280-699.000.

Gans, Michael J., to American Telephone and Telegraph Company AT&T Bell Laboratories. Multidirectional feed and flush-mounted surface wave antenna. 4,682,180, Cl. 343-769.000.

Garcia, Carlos M., to Harris Corporation. Comparator input stage for interface with signal current. 4,682,059, Cl. 307-496.000.

Garcia, Gerald A.: *See*—
Park, Chung P.; and Garcia, Gerald A., 4,681,715, Cl. 264-53.000.

Garcia, Ralph: *See*—
Vasconcellos, Stephen R.; Najjar, Mitri S.; and Garcia, Ralph, 4,681,700, Cl. 252-373.000.

Gardais, Jean-Francois: *See*—
Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, 4,681,740, Cl. 422-78.000.

Gardner, Irwin J.; Fusco, James V.; and Baldwin, Francis P., to Exxon Research & Engineering Co. Process for preparing improved halogenated butyl rubber. 4,681,921, Cl. 525-357.000.

Gardner, John O.: *See*—
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.

Garrett Corporation, The: *See*—
Kredo, Theodore A., 4,681,155, Cl. 165-76.000.

Gassler, Richard D.; and Sridhar, Bettadapur N., to United States of America, Air Force. Missile azimuth alignment system. 4,681,014, Cl. 89-1.816.

Gaudenzi, Gene J.; and Reedy, Dennis C., to International Business Machines Corporation. Switching circuit having low speed/power product. 4,682,056, Cl. 307-456.000.

Gaudenzi, Gene J.: *See*—
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.

Gavezotti, Piero; and Strepparola, Ezio, to Ausimont S.p.A. Stabilizers with arylphosphinic structure for perfluoro-polyether oils and greases. 4,681,693, Cl. 252-49.900.

Gavin, Ann H.: *See*—
Gavin, F. Paul; Brigham, David F.; and Gavin, Ann H., 4,681,901, Cl. 521-54.000.

Gavin, F. Paul; Brigham, David F.; and Gavin, Ann H., to ModuForm, Inc. Neoprene foam of increased continuous volume. 4,681,901, Cl. 521-54.000.

Gavranovic, Lee Roy C.: *See*—
Guidry, John P.; and Gavranovic, Lee Roy C., 4,681,163, Cl. 166-278.000.

Gazdik, Charles E.: *See*—
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.

Geddie, John D. Portable bar. 4,681,244, Cl. 222-144.500.

Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 1-aryl-5-halo-4-nitopyrazoles, herbicidal compositions containing them, and herbicidal method of using them. 4,681,618, Cl. 71-92.000.

Geisen, Pierre; Reillaudoux, Jean-Claude; and Ducret, Bernard, to Soprema S.A. Process for producing airtight sealing of buildings. 4,680,913, Cl. 52-746.000.

General Electric Company: *See*—
Abolins, Visvaldis; and Morelli, Thomas A., 4,681,906, Cl. 524-166.000.
Alley, Robert P., 4,682,083, Cl. 315-307.000.
Barito, Robert W.; and Downs, Kenneth L., 4,681,788, Cl. 428-68.000.
Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, 4,681,915, Cl. 525-148.000.
Brunelle, Daniel J., 4,681,949, Cl. 548-461.000.
Burke, Hubert K.; and Michon, Gerald J., 4,681,440, Cl. 356-218.000.
Childress, Jeffery S.; Dissosway, Marc A.; and Hughes, Houston H., III, 4,682,367, Cl. 455-17.000.
Cotzas, George M.; VanDusen, Morris V.; and VanSchaick, Thomas E., 4,682,068, Cl. 310-198.000.
Crounse, Kim H.; and Archibald, James B., 4,682,064, Cl. 310-61.000.
Evans, Edwin R.; and Torkelson, Arnold, 4,681,913, Cl. 524-862.000.
Hale, Alan A., 4,681,486, Cl. 407-114.000.
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,680,840, Cl. 29-25.350.
Jones, Marshall G., 4,681,396, Cl. 350-96.180.
Laskaris, Evangelos T., 4,682,134, Cl. 335-216.000.
Lewis, Larry N., 4,681,963, Cl. 556-453.000.
Milkovic, Miran, 4,682,102, Cl. 324-142.000.
Niedrach, Leonard W.; and Will, Fritz G., 4,681,673, Cl. 204-415.000.
Rairden, John R., III, 4,681,772, Cl. 427-34.000.
Smith, Daniel P.; and Lillquist, Robert D., 4,682,222, Cl. 358-113.000.
Ulug, Mehmet E., 4,682,324, Cl. 370-85.000.
Ulug, Mehmet E., 4,682,326, Cl. 370-89.000.
Vatis, Dimitrios; Bottomley, Paul A.; and Foster, Thomas H., 4,682,106, Cl. 324-307.000.
Wang, Samuel C.; Swab, John M.; Winn, Michael L.; and Gibbons, Martin D., 4,682,236, Cl. 358-213.260.
Yilmaz, Hamza, 4,682,195, Cl. 357-23.400.

General Electric Company, p.l.c., The: *See*—
Thorpe, Paul, 4,682,071, Cl. 313-43.000.
General Mills, Inc.: *See*—
Palmer, Kenneth L., 4,681,770, Cl. 426-615.000.
General Motors Corporation: *See*—
Henry, Kenneth J.; and Kotwicki, Allan J., 4,680,959, Cl. 73-117.000.
General Signal Corporation: *See*—
Wolaver, Dan H.; and Little, Warren E., 4,682,116, Cl. 328-167.000.
Genex Corporation: *See*—
McGuire, Jeffrey C., 4,681,850, Cl. 435-254.000.
Genstar Structures Limited: *See*—
Armitage, J. Herbert, 4,680,901, Cl. 52-81.000.
Georg Fischer Aktiegesellschaft Brugg: *See*—
Bernath, Oskar, 4,681,003, Cl. 83-80.000.
Gerharz, Reinhold, to United States of America, Army. Omnidirectional electromagnetic lens. 4,682,179, Cl. 343-755.000.
Gerin, Merlin: *See*—
Demeyer, Pierre, 4,682,264, Cl. 361-96.000.
Gesamat AG: *See*—
Schmed, Arthur; and Frei, Hans-Peter, 4,681,028, Cl. 99-289.00R.
GET Gesellschaft fur Elektronik-Technologie mbH: *See*—
Schmali, Karl-Heinz, 4,682,004, Cl. 219-121.0PC.
GFM Gesellschaft: *See*—
Blaimschein, Gottfried, 4,681,491, Cl. 409-200.000.
Ghiringhello, Guglielmo: *See*—
Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, 4,682,002, Cl. 219-121.0LD.
Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, to A. Nattermann & Cie, GmbH. Phospholipid compositions and their use in plant protection spray mixtures. 4,681,617, Cl. 71-86.000.
Gibbons, Martin D.: *See*—
Wang, Samuel C.; Swab, John M.; Winn, Michael L.; and Gibbons, Martin D., 4,682,236, Cl. 358-213.260.
Gibson, Rodney W., to U.S. Philips Corporation. Quadrature demodulation data receiver with phase error correction. 4,682,117, Cl. 329-50.000.
Giersig, Manfred: *See*—
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.
Giesen, Franz-Josef: *See*—
Zerfass, Hans-Rainer; and Giesen, Franz-Josef, 4,681,800, Cl. 428-283.000.
Gilbert Engineering Company, Inc.: *See*—
Hayward, Robert D., 4,681,390, Cl. 439-578.000.
Gill, Frederick A.; and Tocci, Mario P., to Manville Service Corporation. Fibrous mat facer with improved strike-through resistance. 4,681,798, Cl. 428-215.000.
Gilson, Jean-Pierre: *See*—
Edwards, Grant C.; Gilson, Jean-Pierre; and McDaniel, Carl V., 4,681,864, Cl. 502-63.000.
Ginn, Martin E. Staged detergent/fabric treating preparation for use in washing machines. 4,680,916, Cl. 53-440.000.
Ginzburg, Vladimir B.; and Jones, G. Brian, to Wean United Rolling Mills, Inc.; and International Rolling Mill Consultants, Inc. Rolling mill strip tension monitoring and shapemeter assembly. 4,680,978, Cl. 73-862.070.
Girag, David. Pumping system for ships. 4,681,057, Cl. 114-183.00R.
Giuliani, Giovanni, to VECA S.r.l. Valvular device for the inflation of balloons, particularly balloons supported by tubular shafts. 4,681,138, Cl. 137-516.290.
Glaeser, Robert B. Body protective garment. 4,680,813, Cl. 2-2.000.
Glang, Reinhard: *See*—
Hwang, Bao-Tai; Orr-Arienzo, Wendy A.; and Glang, Reinhard, 4,681,657, Cl. 156-657.000.
Glasenapp, Rudi K. H.: *See*—
Bowdy, Fredrick E.; Glasenapp, Rudi K. H.; and Ridgway, Glen E., 4,681,285, Cl. 244-103.00R.
Glaser, Dieter, to Peg Perego Pines S.p.A. Perambulator. 4,681,331, Cl. 280-47.360.
Glasstech, Inc.: *See*—
McMaster, Harold A., 4,681,616, Cl. 65-114.000.
Glatfelter, Edward W., to Boeing Company, The. Low vibration helicopter rotor. 4,681,511, Cl. 416-131.000.
Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., to Boeing Company, The. Integrated system for generating inert gas and breathing gas on aircraft. 4,681,602, Cl. 55-21.000.
Global Castors Limited: *See*—
James, Michael J., 4,681,192, Cl. 188-1.120.
Glory Kogyo Kabushiki Kaisha: *See*—
Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, 4,681,229, Cl. 209-534.000.
Gnyra, Bohdan, to Alcan International Limited. Treatment of refractory articles. 4,681,819, Cl. 428-697.000.
Godbold, Thomas M.; and Baker, William R., to Vanderbilt University. Method of removing pyritic sulfur from coal. 4,681,598, Cl. 44-1.0SR.
Godecke Aktiengesellschaft: *See*—
Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.
Kleinschroth, Jurgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,885, Cl. 514-258.000.
Goel, Anil B., to Ashland Oil, Inc. Rapid setting polymers from bicyclic amide acetals/polyols/polyisocyanates. 4,681,926, Cl. 528-48.000.
Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., to Hewlett-Packard Company. Method for focusing projection printer. 4,681,430, Cl. 355-77.000.
Goerich, Hans-Jurgen, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Wheel suspension. 4,681,342, Cl. 280-690.000.
Goetze AG: *See*—
Zerfass, Hans-Rainer; and Giesen, Franz-Josef, 4,681,800, Cl. 428-283.000.
Gogniat, Paul, to Montres Rado S.A. Electronic watch with operating controls in the back cover of the case. 4,681,461, Cl. 368-69.000.
Goi, Hiroshi: *See*—
Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, 4,681,313, Cl. 271-273.000.
Gold, Peter N. Screwdriver. 4,680,996, Cl. 81-456.000.
Goldberg, Eugene P.: *See*—
Sayano, Reizo; and Goldberg, Eugene P., 4,681,585, Cl. 623-6.000.
Goldenberg, Emanuel; and Douaud, Andre , to Institut Francais du Petrole. Automatic regulating process and device for multifuel internal combustion engines. 4,682,293, Cl. 364-431.050.
Goldfarb, Jerry; and Klenoff, Bruce. Amphibious personal audio system. 4,682,363, Cl. 381-74.000.
Goldner, Erwin P. Pipe tapping tool. 4,680,848, Cl. 29-213.00R.
Golker, Christian: *See*—
Egerer, Peter; Crueger, Wulf; and Golker, Christian, 4,681,843, Cl. 435-41.000.
Gollan, Arye Z., to A/G Technology Corporation. Anisotropic membranes for gas separation. 4,681,605, Cl. 55-158.000.
Goller, Ernst: *See*—
Muller, Adam; and Goller, Ernst, 4,680,946, Cl. 66-64.000.
Gollin, Robert: *See*—
Andre, Guy; Gollin, Robert; and Daloia, Gaetan, 4,680,834, Cl. 24-16.0PB.
Gomez, I. Luis, to Monsanto Company. Fire-resistant interlayer. 4,681,810, Cl. 428-429.000.
Gomibuchi, Reizo: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
Gongwer, Calvin A.: *See*—
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.
Goodman, John T.: *See*—
Graham, Teresita O.; and Goodman, John T., 4,681,698, Cl. 252-182.100.
Gordon, Eric M.: *See*—
Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., 4,681,937, Cl. 540-355.000.
Gordon, Stephen S., to United States of America, National Aeronautics and Space Administration. Self-clamping arc light reflector for welding torch. 4,682,006, Cl. 219-124.340.
Gosser, Lawrence W., to Du Pont de Nemours, E. I., and Company. Catalytic process for making H_2O_2 from hydrogen and oxygen. 4,681,751, Cl. 423-584.000.
Goto, Hiroshi: *See*—
Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.
Goto, Kazuyuki: *See*—
Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, 4,681,826, Cl. 430-65.000.
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, to Mitsubishi Denki Kabushiki Kaisha. Escalator. 4,681,207, Cl. 198-333.000.
Goto, Shigeru: *See*—
Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.
Gould Inc.: *See*—
Seiger, Harvey N., 4,681,663, Cl. 204-21.000.
Gourlandt, Albert J. A. Method and apparatus for automatically treating animals, preferably birds, such as young chicks, young guineafowls, young turkeys. 4,681,565, Cl. 604-115.000.
Govind, Rakesh. Dual distillation columns. 4,681,661, Cl. 202-154.000.
Grabs, Jan W. I.: *See*—
Anflo, Kjell S.; and Grabs, Jan W. I., 4,682,178, Cl. 342-202.000.
Gracey, Howard E.: *See*—
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., 4,681,872, Cl. 514-29.000.
Graco Inc.: *See*—
O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E., 4,681,516, Cl. 417-259.000.
Gradnitzer, Eckhard; and Klautschek, Herwig, to Siemens Aktiengesellschaft. Electrical short-circuit monitoring arrangement for variable-speed, three-phase motors, including their feed lines. 4,682,263, Cl. 361-31.000.
Graff, Allan H.: *See*—
Huzinec, Robert J.; and Graff, Allan H., 4,681,766, Cl. 426-5.000.
Graham, Olin L., to United States of America, National Aeronautics and Space Administration. Method and apparatus for telemetry adaptive bandwidth compression. 4,682,225, Cl. 358-133.000.
Graham, Teresita O.; and Goodman, John T., to Duracell Inc. Electrochemical cells having a gelled anode-electrolyte mixture. 4,681,698, Cl. 252-182.100.
Grand Slam, Inc.: *See*—
Lay, William C., 4,681,318, Cl. 273-26.00R.

Granger, Douglas A.: *See*—
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.

Grannemann, Gerhard: *See*—
Rathert, Horst; Grannemann, Gerhard; and Erdboris, Ulrich, 4,681,500, Cl. 412-33.000.

Grassano, Vincent R. Shock-absorbent connector. 4,681,303, Cl. 267-8.00R.

Grauman, R. J.; Sponagle, G. W.; and Rachuk, T. W. System and method for ice movement detection in determination of ice breakup. 4,680,961, Cl. 73-170.00R.

Graven, Richard G.; and Zahner, John C., to Mobil Oil Corporation. Fixed bed catalytic reactor system with improved liquid distribution. 4,681,674, Cl. 208-59.000.

Grech, Leonard, to Catsouras, George, a part interest. Burner control system. 4,681,084, Cl. 126-52.000.

Greco, Carl C.: *See*—
Ayen, Richard J.; Burk, Johst H.; and Greco, Carl C., 4,681,959, Cl. 556-54.000.

Green, Douglas H.: *See*—
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

Green, Michael J., to BP Chemicals Limited. Transesterification of carboxylic or carbonic esters. 4,681,967, Cl. 558-277.000.

Green, Robert. Portable work device. 4,681,305, Cl. 269-139.000.

Griese, Klaus; Mayer, Siegfried; and Weigle, Dieter, to Robert Bosch GmbH. Radial piston pump having sealing disc. 4,681,514, Cl. 417-213.000.

Griffee, Leslie V.: *See*—
Dumas, Theodore A.; and Griffee, Leslie V., 4,682,181, Cl. 343-789.000.

Griffin, Arnold F.; and Hinchliffe, Warren D., to Norcim Investments Pty. Ltd. Gold Recovery processes. 4,681,628, Cl. 75-118.00R.

Griffith, Ronald C., to Pennwalt Corporation. 7,8,9,10-tetrahydro-6-oxo-6H-dibenzo(b,d)pyranyloxy-propanes. 4,681,954, Cl. 549-280.000.

Griffith University: *See*—
Thiel, David V., 4,682,118, Cl. 329-122.000.

Grigsby, Robert A., Jr.: *See*—
Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.

Grims, Frank J.: *See*—
Stefnik, William S.; and Grims, Frank J., 4,680,902, Cl. 52-126.400.

Grobler, Jan H. A., to Bintech (PTY) Ltd. Delay starters. 4,681,036, Cl. 102-275.300.

Groffen, John: *See*—
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, 4,681,840, Cl. 435-6.000.

Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, to Degussa Aktiengesellschaft. Use of silver-free palladium alloys for firing on dental ceramics. 4,681,735, Cl. 420-464.000.

Gronlund, Robert L.; and Stewart, John, to Knape & Vogt Manufacturing Company. Side mounting bracket for drawer slide. 4,681,289, Cl. 248-224.400.

Groo, Dora: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Grotkasten, Klaus, to Fried. Krupp G.m.b.H. Feeding and positioning apparatus for a heating press. 4,681,521, Cl. 425-36.000.

Grozinger, Karl G.; and Oliver, James T., to Boehringer Ingelheim Pharmaceuticals, Inc. Diazine-ethenylphenyl oxamic acids and esters and salts thereof. 4,681,884, Cl. 514-256.000.

Gruenke, Roger A.: *See*—
Bach, David T.; Gruenke, Roger A.; and Levin, Herman W., 4,681,443, Cl. 356-246.000.

Grushkin, Bernard, to Xerox Corporation. Single component red developer compositions. 4,681,829, Cl. 430-109.000.

GS-Hydro Oy: *See*—
Sundholm, Goran, 4,681,352, Cl. 285-334.100.

GTE Government Systems Corporation: *See*—
Dave, Timothy A.; and Guch, Steve, Jr., 4,682,340, Cl. 372-108.000.

GTE Laboratories Incorporated: *See*—
Sandman, Daniel J.; and Elman, Boris S., 4,681,920, Cl. 525-328.100.

GTE Products Corp.: *See*—
Schulze, Harry O.; and Karam, Ronald E., 4,681,807, Cl. 428-403.000.

GTE Valeron Corporation: *See*—
Koelewijn, Rob, 4,681,485, Cl. 407-42.000.

Guch, Steve, Jr.: *See*—
Dave, Timothy A.; and Guch, Steve, Jr., 4,682,340, Cl. 372-108.000.

Gueret, Jean-Louis H., to "L'Oreal". Rigid make up compact with a flexible inner shell frame. 4,681,127, Cl. 132-82.00R.

Guerra, John M.; and Plummer, William T., to Polaroid Corporation. Optical proximity imaging method and apparatus. 4,681,451, Cl. 356-373.000.

Guevara, Erick: *See*—
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,680,917, Cl. 53-440.000.

Guidry, John P.; and Gavranovic, Lee Roy C., to Well Improvement Specialists, Inc. Sand control system. 4,681,163, Cl. 166-278.000.

Guiler, Richard S.: *See*—
Brammall, Terrence; and Guiler, Richard S., 4,681,355, Cl. 292-323.000.

Guillermet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, to Aluminium Pechiney. Process and apparatus for electrochemical treatment of the surface of metal products of elongate shape. 4,681,665, Cl. 204-14.100.

Guley, Paul C., to American Home Products Corporation. Rapid releasing triamterene containing gelatin capsule dosage forms for once daily antihypertensive use. 4,681,765, Cl. 424-456.000.

H. J. Langen & Sons Limited: *See*—
Langen, Jacobus J., 4,680,832, Cl. 17-25.000.

H. Krantz GmbH & Co.: *See*—
Cramer, Hans, 4,680,839, Cl. 26-89.000.

H. Stoll GmbH & Co.: *See*—
Muller, Adam; and Goller, Ernst, 4,680,946, Cl. 66-64.000.

Haag, Horst G.: *See*—
Zerpner, Dieter; Streck, Roland; and Haag, Horst G., 4,681,961, Cl. 556-428.000.

Haardt, Henry; and Magdon, John, to International Hydron Corporation. Tricurve optical metal master mold and method of making. 4,681,295, Cl. 249-135.000.

Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Polyester polyols, a process for their production and their use in the isocyanate polyaddition process. 4,681,903, Cl. 521-167.000.

Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., to RCA Corporation. Gullwing distortion corrected deflection circuitry for a square-planar picture tube. 4,682,085, Cl. 315-371.000.

Hagelin, Frank H., to Telefonaktiebolaget LM Ericsson. Method of messuring a DC current or a low-frequency AC current. 4,682,100, Cl. 324-117.00R.

Hajime Industries Ltd.: *See*—
Beurskens, Godefridus P. F., 4,682,220, Cl. 358-106.000.
Yoshida, Hajime, 4,682,023, Cl. 250-223.00B.

Hajimoto, Yoshioki: *See*—
Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, 4,682,019, Cl. 250-211.00R.

Haku, Hisao: *See*—
Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, 4,681,826, Cl. 430-65.000.

Halbert, Thomas R.; and Stiefel, Edward I., to Exxon Research and Engineering Company. Dithioacid vanadium sulfide dimer compositions. 4,681,958, Cl. 556-42.000.

Halcour, Kurt: *See*—
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.

Hale, Alan A., to General Electric Company. Triangular cutting tool insert having cutting edges with recesses. 4,681,486, Cl. 407-114.000.

Halkey-Roberts Corporation: *See*—
Lardner, George E., 4,681,132, Cl. 137-271.000.

Hall, Henry B.: *See*—
Drapeau, Donald F.; Moore, Benjamin N.; and Hall, Henry B., 4,682,010, Cl. 219-381.000.

Halldorsson, Thorsteinn; and Seiffarth, Ernst A., to Messerschmitt-Bolkow-Blohm GmbH. Laser radiation warning sensor utilizing polarization. 4,682,024, Cl. 250-225.000.

Halling, Horace P., to Pressure Science Incorporated. V-coupling for installation in narrow annular spaces. 4,681,353, Cl. 285-411.000.

Halliwell, Michael J.; and Zahavi, Joseph. Laser induced selective electroless plating. 4,681,774, Cl. 427-53.100.

Hallmark Cards, Inc.: *See*—
Sanders, Robert E.; Flynn, Charles J.; and Vertreese, John L., 4,682,079, Cl. 315-186.000.

Hama, Yasuo; and Takaku, Shigetake, to Hitachi, Ltd. Ultrasonic probe jig. 4,680,969, Cl. 73-661.000.

Hamada, Mitsuo: *See*—
Saito, Masayuki; and Hamada, Mitsuo, 4,681,636, Cl. 106-287.150.

Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneo, to Toshiyuki Hamaoka Daiichi Seiyaku Co., Ltd. Muramyldipeptide active ester derivatives. 4,681,856, Cl. 536-53.000.

Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, to International Paper Company. Process for providing filled containers. 4,680,917, Cl. 53-440.000.

Han, Joseph U.: *See*—
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.

Hanaway, Richard W., to American Hospital Supply Corporation. Reagent dispenser for an analyzing system. 4,681,741, Cl. 422-100.000.

Hancock, LaVon F. Video tape cassette tool. 4,680,997, Cl. 81-487.000.

Handy Button Machine Company: *See*—
Bush, Earl D., 4,680,915, Cl. 52-766.000.

Hanes, Ronnie M.: *See*—
Chang, Biau-Hung; and Hanes, Ronnie M., 4,681,709, Cl. 260-410.900.

Hann, Michael M.: *See*—
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,681,966, Cl. 558-255.000.

Hanna, Mark: *See*—
Kee, Gene A.; and Hanna, Mark, 4,681,171, Cl. 173-90.000.

Hanson, Donald L.: *See*—
Woffinden, Gary A.; and Hanson, Donald L., 4,682,281, Cl. 364-200.000.
Hansson, Torbjorn: *See*—
Fellers, Christer; Htun, Myat; and Hansson, Torbjorn, 4,680,873, Cl. 34-116.000.
Hanzawa, Kohtaro: *See*—
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.
Hanzawa, Shigeru: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,681,074, Cl. 123-271.000.
Hardy, Frederick E.; and Ingram, Barry T., to Procter & Gamble Company, The. Peracid and bleach activator compounds and use thereof in cleaning compositions. 4,681,592, Cl. 8-111.000.
Hardy, Kenneth J.; and Whitesides, Michael G. Perfusion slit chamber for filter-bound sample analyses. 4,681,853, Cl. 435-288.000.
Hargett, Wyatt P., Jr.: *See*—
Collins, Michael J.; and Hargett, Wyatt P., Jr., 4,681,996, Cl. 219-10.55M.
Hargreaves, Richard E.: *See*—
Balint, Joseph P., Jr.; and Hargreaves, Richard E., 4,681,870, Cl. 502-403.000.
Harimaya, Senichi: *See*—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., to General Electric Company. Method for prepolarizing and centering a piezoceramic power switching device. 4,680,840, Cl. 29-25.350.
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., to Allied Corporation. Multi-layered flexible fiber-containing articles. 4,681,792, Cl. 428-102.000.
Harringer, Robert V.; Rada, Robert O.; and Vesely, Edward J., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Method and apparatus for presenting an article to a work station. 4,681,208, Cl. 198-341.000.
Harris Corporation: *See*—
Beckwith, Paul B., Jr.; and Bistarkey, Donald S., 4,682,160, Cl. 340-729.000.
Doyle, Brent R., 4,682,057, Cl. 307-459.000.
Elsenpeter, William R., 4,682,345, Cl. 379-1.000.
Faith, Richard W.; and Durston, Thomas W., 4,682,346, Cl. 379-22.000.
Garcia, Carlos M., 4,682,059, Cl. 307-496.000.
Harris, Duane H.: *See*—
Mawby, Harold S.; and Harris, Duane H., 4,680,943, Cl. 62-300.000.
Harris, Eugene G.; and Fayter, Richard G., Jr., to National Distillers and Chemical Corporation. Alkyl substituted-2,3-dihydrofuran fragrance compositions. 4,681,703, Cl. 252-522.00R.
Harris Graphics Corporation: *See*—
Winiasz, Michael E., 4,681,213, Cl. 198-803.900.
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, to National Distillers and Chemical Corporation. Catalyst systems for polymerizations at high temperatures. 4,681,924, Cl. 526-125.000.
Harris, Ronald R.: *See*—
Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., 4,681,722, Cl. 264-171.000.
Harris, William H.; Klag, James P.; and Lam, Joseph W., to Thrall Car Manufacturing Company. Lightweight center beam railroad car. 4,681,041, Cl. 105-355.000.
Harrison, Ray E.: *See*—
Murray, Charles R.; and Harrison, Ray E., 4,681,781, Cl. 428-35.000.
Harrison, William H.; Arakawa, Mitsuaki; and McCarten, Barry M., to University of California, The Regents of the. RF coil coupling for MRI with tuned RF rejection circuit using coax shield choke. 4,682,125, Cl. 333-12.000.
Harry Major Machine & Tool Co.: *See*—
Miller, Jack E., 4,681,212, Cl. 198-803.200.
Harsch, Herbert: *See*—
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.
Hart, Charlavan. Personal color analysis method. 4,681,546, Cl. 434-99.000.
Hartenstein, Johannes: *See*—
Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.
Kleinschroth, Jurgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,885, Cl. 514-258.000.
Hartman, Leo, to Hoogovens Groep B.V. Method for the manufacture of metal packaging cans, and a semi-product in the manufacture of such cans. 4,681,237, Cl. 220-70.000.
Hartmann & Braun AG: *See*—
Fabinski, Walter; and Schaefer, Werner, 4,682,031, Cl. 250-345.000.
Hartmann, Clinton S.: *See*—
Ragan, Lawrence H.; Hartmann, Clinton S.; and Ash, Darrell L., 4,682,223, Cl. 380-16.000.
Hartmann, Horst: *See*—
Pfaff, Klaus-Peter; Paust, Joachim; and Hartmann, Horst, 4,681,936, Cl. 536-124.000.
Harvey, Raymond A., to Xerox Corporation. Sheet stacker. 4,681,312, Cl. 271-207.000.
Harvey, Robert D. Method and apparatus for dispensing oil well proppant additive. 4,681,245, Cl. 222-643.000.
Hasegawa, Akinori: *See*—
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.
Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. High-speed spindle. 4,681,492, Cl. 409-231.000.
Hasegawa, Ryuichi; and Hayashi, Kohji, to Mitsubishi Monsanto Chemical Company. Polyester. 4,681,975, Cl. 560-90.000.
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, to Mitsui Petrochemical Industries, Ltd. Composite laminates comprising a metallic substrate and vibration damper. 4,681,816, Cl. 428-463.000.
Hashimoto, Seiji: *See*—
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, to Citizen Watch Co., Ltd. Gimbal spring supported magnetic recording head. 4,682,254, Cl. 360-103.000.
Hashizume, Kenji: *See*—
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.
Hassan, Morris, to Chrysler Motors Corporation. Deflection jounce bumper for strut suspension. 4,681,304, Cl. 267-8.00R.
Hatayama, Fumihiro, to Dainippon Screen Mfg. Co., Ltd. Magnification ratio conversion in image reproduction. 4,682,243, Cl. 358-287.000.
Hathaway, Doris: *See*—
Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, 4,681,735, Cl. 420-464.000.
Hatmann, Clinton S.: *See*—
Ragan, Lawrence H.; Hatmann, Clinton S.; and Ash, Darrell L., 4,682,224, Cl. 380-16.000.
Haugwitz, Rudiger D.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Substituted 4-phenoxy or 4-phenylthio prolines. 4,681,886, Cl. 514-259.000.
Hauni-Werke Korber & Co. KG: *See*—
Hinzmann, Alfred; Preisner, Peter; and Presser, Erich, 4,681,124, Cl. 131-109.100.
Haury, Andre : *See*—
Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.
Hayakawa, Kizo: *See*—
Yamanaka, Teruo; Sugimoto, Takao; and Hayakawa, Kizo, 4,680,960, Cl. 73-117.300.
Hayasaki, Koichi; and Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Downshift timing and engine brake control for automatic transmission. 4,680,992, Cl. 74-869.000.
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, to Shionogi & Co., Ltd. Thiazinephosphonic acid derivatives. 4,681,874, Cl. 514-90.000.
Hayashi, Kazuhiro: *See*—
Okumura, Yasuyuki; and Hayashi, Kazuhiro, 4,682,327, Cl. 370-100.000.
Hayashi, Kohji: *See*—
Hasegawa, Ryuichi; and Hayashi, Kohji, 4,681,975, Cl. 560-90.000.
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, to Mitsubishi Jukogyo Kabushiki Kaisha; and Churyo Engineering Co., Ltd. Device for extracting water from a load of washed articles. 4,680,874, Cl. 34-143.000.
Hayashi, Shoichiro: *See*—
Yamauchi, Takashi; Hayashi, Shoichiro; and Sasakawa, Atsushi, 4,681,978, Cl. 562-413.000.
Hayashi, Shozo: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for use in cab-over type vehicles. 4,681,179, Cl. 180-68.400.
Hayduchok, Leon; and Strauss, Leopold, to All-Mark Corporation, Inc. Kit comprising multicolored fluid dispenser markers together with eradicating fluid dispenser, stamps and stamp pad. 4,681,471, Cl. 401-34.000.
Hayman, Dennis J., to United States Brass Corporation. Tub-shower diverter apparatus. 4,681,140, Cl. 137-597.000.
Hayward, Robert D., to Gilbert Engineering Company, Inc. Nonradiating coaxial outlet. 4,681,390, Cl. 439-578.000.
Hazato, Tadahiko: *See*—
Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.
Heagerty, Michael S. Drawing guide. 4,680,864, Cl. 33-26.000.
Heath, Robert B.; and Nagel, Colin M., to Safe-N-Sound Pty. Limited. Child restraint bassinet. 4,681,368, Cl. 297-250.000.
Hebrank, John H., to Embrex Inc. High speed automated injection system for avian embryos. 4,681,063, Cl. 119-1.000.
Heckler & Koch GmbH: *See*—
Beckmann, Rudi, 4,681,018, Cl. 89-33.040.
Brandl, Rudolf; and Matt, Heinz, 4,681,019, Cl. 89-33.040.
Hedden, Jerry C.: *See*—
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,681,802, Cl. 428-288.000.
Hedley, David J.: *See*—
David, Morgan W. A.; and Hedley, David J., 4,682,217, Cl. 358-89.000.

Heeks, John S.: *See—*
Corfield, Kenneth G.; and Heeks, John S., 4,682,323, Cl. 370-4.000.

Heerah, Atma, to U.S. Philips Corporation. Digital video signal processing apparatus for providing zoom and compressive images with soft focus. 4,682,227, Cl. 358-160.000.

Heidelberger Druckmaschinen AG: *See—*
Jeschke, Willi; Kipphan, Helmut; and Loffler, Gerhard, 4,681,455, Cl. 356-445.000.

Heidinger, Alfred J.; and Duyckinck, Robert W., to Mikropul Corporation. Analytic sieving apparatus. 4,681,676, Cl. 209-380.000.

Heilmann, Paul: *See—*
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.

Heindl, Alfons: *See—*
Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, 4,681,560, Cl. 604-9.000.

Heine, Helmut A.: *See—*
Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, 4,681,413, Cl. 351-205.000.

Heine Optotecnik GmbH & Co. KG: *See—*
Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, 4,681,413, Cl. 351-205.000.

Heinemann, Otto; and Schmits, Heinz-Herbert, to Krupp Polysius AG. Driving apparatus. 4,681,021, Cl. 91-178.000.

Heinrich Baumgarten KG: *See—*
Baumgarten, Rolf, 4,680,829, Cl. 16-114.00A.

Heinrich, Charles E.: *See—*
Swenson, Paul F., Jr.; and Heinrich, Charles E., 4,681,510, Cl. 415-168.000.

Heisterkamp, Nora: *See—*
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, 4,681,840, Cl. 435-6.000.

Heitz, Alfred J.: *See—*
Rogers, Leo C.; and Heitz, Alfred J., 4,681,652, Cl. 156-613.000.

Hella KG Hueck & Co.: *See—*
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, 4,682,274, Cl. 362-61.000.

Helland, Randall H.; and Burton, Craig A., to Minnesota Mining and Manufacturing Company. Fluorinated carbon-containing developer composition. 4,681,830, Cl. 430-110.000.

Hellbach, Hans: *See—*
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.

Hellman, Nat, III, to Microcomputer Accessories, Inc. Modular cable management system for related electronics equipment. 4,681,378, Cl. 312-108.000.

Hemmeke, Ronald L.; and Spykerman, Scott A., to Prince Corporation. Visor system. 4,681,363, Cl. 296-97.00G.

Hendrix, James L.; and Braun, Leroy O., to Hughes Aircraft Company. Q-switched laser resonator of integral construction. 4,682,336, Cl. 372-10.000.

Henkell & Co.: *See—*
Weiss, Manfred, 4,681,767, Cl. 426-14.000.

Henry, Kenneth J.; and Kotwicki, Allan J., to General Motors Corporation. Emulation system for a motor vehicle drivetrain. 4,680,959, Cl. 73-117.000.

Henschen, Agnes: *See—*
Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich, 4,681,871, Cl. 514-15.000.

Hensens, Otto D.: *See—*
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Herbert, John M. Apparatus for preparing frozen drinks. 4,681,030, Cl. 99-484.000.

Herges, Peter: *See—*
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Herman, Thomas: *See—*
Lidow, Alexander; and Herman, Thomas, 4,680,853, Cl. 29-571.000.

Hernandez, Kenneth J., to Manville Corporation. Wrap-around carrier with improved handle. 4,681,217, Cl. 206-141.000.

Herron, Marie. Cervical exam teaching method. 4,681,547, Cl. 434-273.000.

Hershel, Ronald S. Condenser system. 4,681,414, Cl. 353-102.000.

Hewitt, Steven W.: *See—*
Simkins, Philip P., 4,681,216, Cl. 206-45.130.

Hewlett Packard Company: *See—*
Davidson, Robert J., 4,681,447, Cl. 356-351.000.
Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., 4,681,430, Cl. 355-77.000.
Johnson, Samuel A., 4,680,859, Cl. 29-611.000.
Quan, Ronald, 4,682,015, Cl. 235-472.000.
Sieger, Roger R.; and Walsh, Edward, 4,682,255, Cl. 360-106.000.

Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., to NCR Corporation. System for selectively coupling a plurality of stations into a single communications path. 4,682,325, Cl. 370-85.000.

Hibi, Takuo: *See—*
Araki, Masashi; and Hibi, Takuo, 4,681,979, Cl. 585-640.000.

Hickling, Colin D., to Trig, Inc. Dynamically optimized thermostat (dot) with tunable bimetal element. 4,682,141, Cl. 337-379.000.

Hicks, John W., Jr., to Polaroid Corporation. Stressed core optical fiber and method. 4,681,399, Cl. 350-96.300.

Hidaka, Hidemasa: *See—*
Adachi, Takashi; and Hidaka, Hidemasa, 4,681,771, Cl. 426-658.000.

Hieronymi, Richard: *See—*
Briner, Emil; and Hieronymi, Richard, 4,680,924, Cl. 57-263.000.

High Brandon Incorporated: *See—*
Shu, Brandon, 4,681,083, Cl. 126-9.00R.

Highstreet, Edward J.: *See—*
Stannard, Forrest B.; and Highstreet, Edward J., 4,681,689, Cl. 210-784.000.

Hildebrandt, Edmund. Top and board therefor. 4,681,320, Cl. 273-109.000.

Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., to PJH, Inc. Underwater dredging apparatus and cutter head therefor. 4,680,879, Cl. 37-67.000.

Hill, Edwin L.: *See—*
Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., 4,680,879, Cl. 37-67.000.

Hill, Ernest W.: *See—*
Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., 4,680,879, Cl. 37-67.000.

Hillman, Tom V. Holder for bicycle chains. 4,681,557, Cl. 474-119.000.

Hilti Aktiengesellschaft: *See—*
Millauer, Wolfgang; and Raab, Dieter, 4,681,489, Cl. 408-1.00R.
Vollmer, Helmut; Kousek, Heinz; and Maier, Elmar, 4,681,493, Cl. 411-8.000.

Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, to TMC Corporation. Ski binding part, in particular a front jaw. 4,681,339, Cl. 280-633.000.

Hinchliffe, Warren D.: *See—*
Griffin, Arnold F.; and Hinchliffe, Warren D., 4,681,628, Cl. 75-118.00R.

Hinck, Karl-Heinz, to Starcosa GmbH. Process for treating and converting of iso-glucose sirup. 4,681,639, Cl. 127-30.000.

Hines, Frank: *See—*
Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.

Hinn, Werner, to RCA Corporation. Video output signal clamping circuit. 4,682,233, Cl. 358-173.000.

Hino, Kuniaki: *See—*
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.

Hinzmann, Alfred; Preisner, Peter; and Presser, Erich, to Hauni-Werke Korber & Co. KG. Apparatus for manipulating particles of tobacco or filter material. 4,681,124, Cl. 131-109.100.

Hirama, Shigemitsu; Aida, Satoru; and Soyama, Hideo. Article delivery transferring device in a collective packing machine. 4,680,919, Cl. 53-499.000.

Hirano, Kenichiro: *See—*
Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.

Hirata, Tsutomu: *See—*
Matsumoto, Kunio; and Hirata, Tsutomu, 4,681,841, Cl. 435-18.000.

Hirono, Tatsuo: *See—*
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Hiros, Laszlo; Banati, Gabor; and Lipscher, Ervin, to Medicor Muyek. Ionisator for vehicles. 4,682,265, Cl. 361-231.000.

Hirose Elec. Co., Ltd.: *See—*
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.

Hirota, Akira, to Victor Company of Japan, Ltd. Apparatus for recording a video signal sampled at frequency f_s and reproducing the video signal as a signal essentially sampled at frequency $2f_s$, 4,682,250, Cl. 360-33.100.

Hirota, Akira; and Tsushima, Takuya, to Victor Company of Japan, Ltd. Video signal reproducing apparatus having a noise reduction circuit. 4,682,251, Cl. 360-33.100.

Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, to Solarcraft, Inc. Solar powered headwear fan. 4,680,815, Cl. 2-171.300.

Hisamoto, Iwao; and Yamana, Masayuki, to Daikin Industries Ltd. Fluorine-containing polymer. 4,681,974, Cl. 560-87.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Watanabe, Kenichi, 4,681,452, Cl. 356-375.000.

Hitachi, Ltd.: *See—*
Hama, Yasuo; and Takaku, Shigetake, 4,680,969, Cl. 73-661.000.
Kobayashi, Haruhiko; and Otani, Tadahiko, 4,681,077, Cl. 123-489.000.
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.
Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, 4,682,096, Cl. 318-808.000.

Ogawa, Soichiro; and Watanabe, Yoshio, 4,682,080, Cl. 315-209.00R.
Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, 4,682,152, Cl. 340-347.0DD.
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.
Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.
Sakurada, Shuroku; and Ikeda, Yasuhiko, 4,682,198, Cl. 357-38.000.
Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.
Tomita, Yoshifumi, 4,681,824, Cl. 430-24.000.
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.
Watanabe, Kenichi, 4,681,452, Cl. 356-375.000.
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.

Hitachi Medical Corp.: *See*—
Horiba, Isao; and Ishikawa, Ken, 4,682,301, Cl. 364-724.000.

Hitachi Metals, Ltd.: *See*—
Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, 4,681,813, Cl. 428-450.000.

Hitachi Seiki Co., Ltd.: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.

Hitzman, Donald O.: *See*—
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.

Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., to Northern Telecom Limited. Forming low resistivity hillock free conductors in VLSI devices. 4,680,854, Cl. 29-576.00B.

Hodkin, George A.; and Blane, Roger H., to Associated Electrical Industries Limited. Switch selector mechanism. 4,681,988, Cl. 200-17.00R.

Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., to U.S. Philips Corporation. Electron-beam device and semiconductor device for use in such an electron-beam device. 4,682,074, Cl. 313-444.000.

Hoechst Aktiengesellschaft: *See*—
Franke, Werner; and Brahm, Richard, 4,681,827, Cl. 430-83.000.
Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen, 4,681,931, Cl. 530-351.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., 4,681,879, Cl. 514-211.000.

Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, to Daimler-Benz Aktiengesellschaft. Apparatus for the automatic engagement and disengagement of drive elements of a motor vehicle. 4,681,185, Cl. 180-247.000.

Hoffman, John P., to Caterpillar Inc. Position to duty cycle conversion apparatus and method. 4,682,151, Cl. 340-347.0SY.

Hoffman-La Roche Inc.: *See*—
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.

Hoffmann, Dieter; and Trumper, Reinhard, to O & K Orenstein & Koppel AG. Displaceable inclined hoist. 4,681,205, Cl. 198-307.100.

Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, to Degussa Aktiengesellschaft. Furnace for the partial heat treatment of work tools. 4,682,011, Cl. 219-390.000.

Hoffmann-La Roche Inc.: *See*—
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,681,962, Cl. 556-441.000.
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.

Hoffmeister, Dietrich, to Carl-Zeiss-Stiftung. Cooling chamber for processing specimens for microscopic and electron-microscopic investigations. 4,680,945, Cl. 62-514.00R.

Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, to Metzeler Kautschuk GmbH. Two chamber engine mount with hydraulic damping. 4,681,306, Cl. 267-140.100.

Hogan, Timothy. Power tool device. 4,680,831, Cl. 17-23.000.

Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, to Dainippon Screen Mfg. Co., Ltd. Image pickup apparatus for a printed wiring board. 4,682,040, Cl. 250-571.000.

Holecek, Allen R.: *See*—
Breitenstein, Charles T.; and Holecek, Allen R., 4,680,896, Cl. 51-215.0UE.

Holladay, Wilfred E. Book holder. 4,681,291, Cl. 248-444.100.

Holland Colours Apeldoorn B.V.: *See*—
Bes, Richard F. T.; and Knol, Jan D., 4,681,632, Cl. 106-19.000.

Holland, George W.; Maag, Hans; and Rosen, Perry, to Hoffmann-La Roche Inc. Novel 7-fluoro-dihydro PGI compounds. 4,681,962, Cl. 556-441.000.

Hollander, James M. Defogging and deicing shield structure. 4,682,007, Cl. 219-211.000.

Holle, Bernd: *See*—
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.

Holle, Eerke: *See*—
Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, 4,682,098, Cl. 323-315.000.

Hollister Incorporated: *See*—
Tokarz, Joseph S.; and Jensen, Marvin E., 4,681,572, Cl. 604-329.000.

Holloman, Charles J., to Trans-Lux Corporation. Electronic display unit. 4,682,162, Cl. 340-799.000.

Holmes, Arthur S.: *See*—
O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.

Holscher, Uvo, to Dragerwerk Aktiengesellschaft. Electrochemical measuring cell having an ancillary electrode. 4,681,115, Cl. 128-635.000.

Holt, Brian: *See*—
Richardson, Norman; Holt, Brian; and Cook, Barry, 4,681,686, Cl. 210-699.000.

Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., to Conrac Corporation. Welding transformer and rectifier assembly. 4,682,000, Cl. 219-116.000.

Holtman, Dennis C.: *See*—
Stern, Beth A.; and Holtman, Dennis C., 4,681,577, Cl. 604-378.000.

Home, William. Automatic electronic ignition system. 4,681,529, Cl. 431-74.000.

Homma, Koichi: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.

Honczarenko, Art, to Progressive Machine Co., Inc. Traversing mechanism control. 4,681,275, Cl. 242-67.10R.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Anno, Nobuo; and Arai, Takeo, 4,681,068, Cl. 123-41.860.
Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.
Nishikawa, Masao; and Aoki, Takashi, 4,680,928, Cl. 60-329.000.
Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.
Shimizu, Yasuo, 4,681,181, Cl. 180-79.100.
Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyozo, 4,681,075, Cl. 123-339.000.

Honda, Susumu: *See*—
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.

Honeywell Inc.: *See*—
Donovan, William J., 4,682,061, Cl. 307-571.000.
Johnson, James S.; and Albrecht, Gene A., 4,680,866, Cl. 33-356.000.
Schuetz, James A., 4,681,812, Cl. 428-432.000.

Honma, Masayuki, to Nissan Motor Co., Ltd. Overhead camshaft engine. 4,681,069, Cl. 123-90.270.

Hood, Larry L.; and Imonti, Maurice M., to CooperVision, Inc. Ultrasonic decoupling sleeve. 4,681,561, Cl. 604-22.000.

Hoodless, Adrian H. W.: *See*—
Mallinson, Andrew M.; and Hoodless, Adrian H. W., 4,682,086, Cl. 315-371.000.

Hoogovens Groep B.V.: *See*—
Hartman, Leo, 4,681,237, Cl. 220-70.000.

Hooke, Anne M.: *See*—
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,681,762, Cl. 424-92.000.

Hooven, Michael D., to Cordis Corporation. Plural valve three stage pressure relief system. 4,681,559, Cl. 604-9.000.

Hopewell, Richard B.: *See*—
O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.

Hopkins, Thomas R.: *See*—
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Door shoe assembly. 4,680,903, Cl. 52-127.800.

Hori, Ryuzou: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Horiba, Isao; and Ishikawa, Ken, to Hitachi Medical Corp. Digital filter for processing two-dimensional digital images. 4,682,301, Cl. 364-724.000.

Horie, Naoki: *See*—
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.

Horikoshi, Koki: *See*—
Shibanai, Ichiro; Horikoshi, Koki; and Kato, Takashi, 4,681,934, Cl. 536-46.000.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.

Horizon Exploration Limited: *See*—
Newman, Paul, 4,682,307, Cl. 367-21.000.

Horn-Plastik Theodor Horn KG: *See*—
Horn, Stephanie, 4,681,785, Cl. 428-43.000.

Horn, Stephanie, to Horn-Plastik Theodor Horn KG. Supply roll for protective covers especially those made out of sheet plastic, for motor-vehicle seats. 4,681,785, Cl. 428-43.000.

Horng, Sheng-Chorng. Sport shoe lacing device. 4,680,835, Cl. 24-117.000.

Horodysky, Andrew G., to Mobil Oil Corporation. Multifunctional lubricant/fuel additives and compositions thereof. 4,681,692, Cl. 252-32.500.

Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary composition. 4,681,896, Cl. 514-552.000.
Horvath, Barbara L.: *See*—
Horvath, Ronald F.; and Horvath, Barbara L., 4,681,144, Cl. 141-1.000.
Horvath, Ronald F.; and Horvath, Barbara L. Automatic fueling apparatus and method. 4,681,144, Cl. 141-1.000.
Hosaka, Takefumi: *See*—
Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.
Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Masao, deceased; and Hoshino, Yoshihiro, legal representative, 4,681,011, Cl. 84-313.000.
Hoshino, Masao, deceased; and by Hoshino, Yoshihiro, legal representative, to Hoshino Gakki Co., Ltd. Tremolo arm mounting for stringed instrument. 4,681,011, Cl. 84-313.000.
Hoshino, Takashi: *See*—
Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, 4,682,152, Cl. 340-347.0DD.
Hoshino, Yoshihiro, legal representative: *See*—
Hoshino, Masao, deceased; and Hoshino, Yoshihiro, legal representative, 4,681,011, Cl. 84-313.000.
Hosoi, Hiroomi: *See*—
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.
Hospers, Martin: *See*—
Olofsson, Lars; and Hospers, Martin, 4,681,241, Cl. 221-124.000.
Hostetler, Donald E.: *See*—
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, to Mazda Motor Corporation. Engine idling load control means. 4,682,044, Cl. 290-40.000.
Hoult, Robert A.; and Ragusa, Robert P., to Perkin-Elmer Corporation, The. Detector preamplifier for use with a MCT detector. 4,682,022, Cl. 250-214.00A.
Howard Smith Screen Company: *See*—
Arterbury, Bryant A.; and Spangler, James E., 4,681,161, Cl. 166-227.000.
Howe, Dwayne E.: *See*—
Furlong, James J.; and Howe, Dwayne E., 4,682,272, Cl. 361-437.000.
Howeth, D. Franklin. Top loading and inverted backflushed air filter systems. 4,681,609, Cl. 55-302.000.
Hruska, Arturo. Apparatus for welding dental elements. 4,681,999, Cl. 219-111.000.
Hsien-Yang, Chang. Toy device which can be opened and positioned at any desired angle. 4,681,554, Cl. 446-231.000.
Hsu, Ed C.; and Temple, Chester S., to PPG Industries, Inc. Treated glass fibers and nonwoven sheet-like mat and method. 4,681,658, Cl. 162-156.000.
Htun, Myat: *See*—
Fellers, Christer; Htun, Myat; and Hansson, Torbjorn, 4,680,873, Cl. 34-116.000.
Huang, Peter H., to United States of America, Commerce. Humidity sensing and measurement employing halogenated organic polymer membranes. 4,681,855, Cl. 436-39.000.
Huber, Alois: *See*—
Aarts, Petrus J. J.; and Huber, Alois, 4,681,281, Cl. 242-200.000.
Huber, Bernhard, to Perkin-Elmer Corporation, The. Gas control device for controlling the fuel gas and oxidizing agent supply to a burner in an atomic absorption spectrometer. 4,681,530, Cl. 431-89.000.
Huels Aktiengesellschaft: *See*—
Zerpner, Dieter; Streck, Roland; and Haag, Horst G., 4,681,961, Cl. 556-428.000.
Huff, John: *See*—
Zurilla, Ronald W.; and Huff, John, 4,681,641, Cl. 148-6.15Z.
Huffy Corporation: *See*—
Diekman, Robert L., 4,680,849, Cl. 29-252.000.
Hufman, Marie C.; and Hufman, Norman C. Level with dual pointers. 4,680,867, Cl. 33-391.000.
Hufman, Norman C.: *See*—
Hufman, Marie C.; and Hufman, Norman C., 4,680,867, Cl. 33-391.000.
Hugele, Benoit, to Hutchinson S.A. Safety device and tire construction for vehicles or other contrivances. 4,681,147, Cl. 152-158.000.
Hughes Aircraft Company: *See*—
Hendrix, James L.; and Braun, Leroy O., 4,682,336, Cl. 372-10.000.
Larson, Lawrence E., 4,682,149, Cl. 340-347.0DA.
Oldham, Susan L., 4,681,718, Cl. 264-102.000.
Hughes, Houston H., III: *See*—
Childress, Jeffery S.; Disscsway, Marc A.; and Hughes, Houston H., III, 4,682,367, Cl. 455-17.000.
Hughes, John L., to Hughes Technology PTY LTD. Composite laser oscillator. 4,682,335, Cl. 372-6.000.
Hughes, John L.: *See*—
Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L., 4,681,436, Cl. 356-121.000.
Hughes, Simon H. C., to Kabushiki Kaisha Toshiba. Magnetic resonance imaging magnet. 4,682,111, Cl. 324-320.000.
Hughes Technology PTY LTD: *See*—
Hughes, John L., 4,682,335, Cl. 372-6.000.
Hughes Tool Company: *See*—
Crowe, William E., 4,681,193, Cl. 188-67.000.
Cuiper, Glen H., 4,681,166, Cl. 166-345.000.
Huls Aktiengesellschaft: *See*—
Scharf, Helmut; and Krix, Wilfried, 4,681,046, Cl. 110-346.000.
Hummel, Karl, to Interlava AG. Vacuum cleaner. 4,680,827, Cl. 15-319.000.
Humphreys, Paula L.; and Dietsche, Thomas J., to Dow Chemical Company, The. Preparation of symmetrical tetrachloropyridine from chlorinated β-(trichloromethyl) pyridines employing a catalyst. 4,681,945, Cl. 546-345.000.
Hung, Peter; and De Luca, Paul V., to Porta Systems Corp. Resilient sealing device for telephone subscriber terminals. 4,681,383, Cl. 439-135.000.
Hunsucker, William A. Roll restraint of anchored vessel. 4,681,059, Cl. 114-293.000.
Hunt, Charles D'A., to Degussa Electronics Inc. Ingot produced by a continuous casting method. 4,681,787, Cl. 428-577.000.
Hunt, Paul D.: *See*—
Rice, Mark S.; and Hunt, Paul D., 4,681,054, Cl. 114-124.000.
Hunter Engineering Company, Inc.: *See*—
Flowers, John E.; Romanowski, Christopher A.; and Smith, Dennis M., 4,681,152, Cl. 164-477.000.
Hupka, Gyorgy: *See*—
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto ; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.
Huse, Richard: *See*—
Ahmad, Anees; and Huse, Richard, 4,681,408, Cl. 350-609.000.
Huston, Jon: *See*—
Leisman, Thomas; and Huston, Jon, 4,681,186, Cl. 182-47.000.
Huszczuk, Andrew R., to Research and Education Institute, Inc. Harbor-UCLA Medical Center. Respiratory analyzer calibration apparatus with controlled respiratory gas exchange simulation. 4,680,956, Cl. 73-1.00G.
Hutchinson S.A.: *See*—
Hugele, Benoit, 4,681,147, Cl. 152-158.000.
Huynh, Anh N.; and Ziogas, Phoivos D., to National Distillers and Chemical Corporation. Ozonator power supply employing a current source inverter. 4,682,266, Cl. 361-235.000.
Huzinec, Robert J.; and Graff, Allan H., to Warner-Lambert Company. Coatings for chewing gums containing gum arabic and a soluble calcium salt. 4,681,766, Cl. 426-5.000.
Hwang, Bao-Tai; Orr-Arienzo, Wendy A.; and Glang, Reinhard, to International Business Machines Corporation. Preferential chemical etch for doped silicon. 4,681,657, Cl. 156-657.000.
Hwo, Charles C., to Shell Oil Company. Polybutylene room temperature aged film. 4,681,804, Cl. 428-349.000.
Hydes, Paul C.: *See*—
Picker, Donald H.; and Hydes, Paul C., 4,681,091, Cl. 128-1.00R.
Hydril Company: *See*—
Weston, Harry, 4,681,133, Cl. 137-315.000.
Hydronautics, Incorporated: *See*—
Johnson, Virgil E., Jr., 4,681,264, Cl. 239-589.100.
Hyodo, Masakatsu; and Yagi, Isaburo, to Ashimori Industry Co., Ltd. Tubular lining material for pipe lines. 4,681,783, Cl. 428-36.000.
Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, to Stanley Electric Co., Ltd. Headlamp for vehicle. 4,682,072, Cl. 313-115.000.
Ichikawa, Yoshio; and Yamada, Kazumori, to NEC Corporation. Display pager having memory overflow indication and concurrent message display functions. 4,682,148, Cl. 340-311.100.
Ichikoh Industries, Ltd.: *See*—
Enomoto, Masao, 4,681,409, Cl. 350-637.000.
Ichimori, Yuzo: *See*—
Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, 4,681,848, Cl. 435-240.000.
Ichinari, Mitsuhiro: *See*—
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
Igarashi, Yosuke, to Kabushiki Kaisha Toshiba. Information reading device with driver circuitry separate from sensor board. 4,682,042, Cl. 250-578.000.
Iha, Yukihiro: *See*—
Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, 4,681,927, Cl. 528-232.000.
Ihara, Keisuke: *See*—
Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.
Iizuka, Tetsuya: *See*—
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,682,306, Cl. 365-222.000.
Ikeda, Kazushige: *See*—
Mouri, Akihiko; and Ikeda, Kazushige, 4,680,929, Cl. 60-368.000.
Ikeda, Shigeru; and Okamura, Naomi, to Cemedine Co., Ltd. Extrusion device. 4,681,524, Cl. 425-376.00R.
Ikeda, Yasuhiko: *See*—
Sakurada, Shuroku; and Ikeda, Yasuhiko, 4,682,198, Cl. 357-38.000.
Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, to Fanuc Ltd. Data transfer system for numerically controlled equipment. 4,682,167, Cl. 340-825.230.
Ikeda, Yoshinori, to Canon Kabushiki Kaisha. Image processing apparatus for combining image and character data. 4,682,190, Cl. 346-154.000.
Ikejima, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for elevator. 4,681,191, Cl. 187-119.000.
Ikemura, Yuichi; and Takano, Hiroshi, to Victor Company of Japan, Ltd. Automatic white balance adjusting circuit for image pickup device. 4,682,210, Cl. 358-29.000.
Ilk, Emil. Drinking glass having a press-molded stem and a base (or pedestal). 4,681,236, Cl. 215-99.500.

Imataki, Hiroyuki: *See*—
Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, 4,682,019, Cl. 250-211.00R.

Imberge, Paul-Robert: *See*—
Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.

Imonti, Maurice M.: *See*—
Hood, Larry L.; and Imonti, Maurice M., 4,681,561, Cl. 604-22.000.

Imperial Chemical Industries PLC: *See*—
Pinto, Alwyn, 4,681,745, Cl. 423-359.000.
Williams, John; and Robson, Michael J., 4,681,969, Cl. 558-407.000.

IMRE Corporation: *See*—
Balint, Joseph P., Jr.; and Hargreaves, Richard E., 4,681,870, Cl. 502-403.000.

In-Situ, Inc.: *See*—
Wainwright, H. Kent, 4,682,156, Cl. 340-603.000.

Inaba, Yoshihiro: *See*—
Machashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.

Inagaki, Hazime: *See*—
Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, 4,680,963, Cl. 73-204.000.

Inagaki, Hiroshi: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Inagaki, Yoshio: *See*—
Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, 4,681,836, Cl. 430-434.000.

Inazawa, Yoshizumi: *See*—
Furuya, Tsuneo; and Inazawa, Yoshizumi, 4,682,312, Cl. 369-32.000.

Incardona, Angelo: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.

Industrial Research Development, Inc.: *See*—
Stewart, Victor M., 4,680,909, Cl. 52-409.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Castellano, Pietro, 4,682,188, Cl. 346-140.00R.

Ingels, Luis: *See*—
White, Larry; and Ingels, Luis, 4,680,825, Cl. 15-105.000.

Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Isoxazolidine insecticides and fungicides. 4,681,892, Cl. 514-378.000.

Ingram, Alvin R., to Atlantic Richfield Company. Anti-static styrene polymer particles by impregnation. 4,681,779, Cl. 427-222.000.

Ingram, Barry T.: *See*—
Hardy, Frederick E.; and Ingram, Barry T., 4,681,592, Cl. 8-111.000.

Innovative Controls, Incorporated: *See*—
Kuhnel, Donald S.; and Ottenstein, Sidney A., 4,682,084, Cl. 315-307.000.

Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, to NEC Corporation. Key telephone system. 4,682,353, Cl. 379-163.000.

Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, to Fanuc Ltd. Wire-cut, electric discharge machining power supply unit. 4,681,997, Cl. 219-69.00C.

Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for forming high contrast negative image using the same. 4,681,836, Cl. 430-434.000.

Inoue, Shigeki: *See*—
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.

Inoue, Shosaku: *See*—
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.

Inoue, Toshiyuki, to Nisshin Kohki Co., Ltd. Pen-type bar code reader. 4,682,016, Cl. 235-462.000.

Institut Francais du Petrole: *See*—
Dedole, Pascal; and Laurent, Jean, 4,682,309, Cl. 367-146.000.
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.
Goldenberg, Emanuel; and Douaud, Andre , 4,682,293, Cl. 364-431.050.
Rojey, Alexandre; and Ramet, Claude, 4,680,939, Cl. 62-114.000.

Integrated Automation Limited: *See*—
Bok, Edward, 4,681,776, Cl. 427-85.000.

Interlava AG: *See*—
Hummel, Karl, 4,680,827, Cl. 15-319.000.

Intermedics Intraocular, Inc.: *See*—
Sayano, Reizo; and Goldberg, Eugene P., 4,681,585, Cl. 623-6.000.

International Business Machinces Corporation: *See*—
Karidis, John P., 4,681,467, Cl. 400-124.000.

International Business Machines Corporation: *See*—
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.
Chapman, Dale B., 4,682,121, Cl. 331-1.00A.
Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.
Gaudenzi, Gene J.; and Reedy, Dennis C., 4,682,056, Cl. 307-456.000.
Hwang, Bao-Tai; Orr-Arienzo, Wendy A.; and Glang, Reinhard, 4,681,657, Cl. 156-657.000.
Iwami, Tomoyuki, 4,682,297, Cl. 364-521.000.
Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., 4,681,424, Cl. 355-14.00R.
Millham, Ernest H., 4,682,330, Cl. 371-20.000.
Wagner, Dietmar, 4,681,442, Cl. 356-237.000.

International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.

International Hydron Corporation: *See*—
Haardt, Henry; and Magdon, John, 4,681,295, Cl. 249-135.000.

International Paper Company: *See*—
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,680,917, Cl. 53-440.000.

International Power Technology, Inc.: *See*—
Cheng, Dah Y., 4,680,927, Cl. 60-39.300.

International Rectifier Corporation: *See*—
Lidow, Alexander; and Herman, Thomas, 4,680,853, Cl. 29-571.000.

International Rolling Mill Consultants, Inc.: *See*—
Ginzburg, Vladimir B.; and Jones, G. Brian, 4,680,978, Cl. 73-862.070.

Interpublic a.s: *See*—
Sondov, Sten Y.; and From, Jan O., 4,681,688, Cl. 210-770.000.

Intersteel Technology, Inc.: *See*—
Vallomy, John A., 4,681,537, Cl. 432-242.000.

Intradym Maschinen AG: *See*—
Egger, Hans R., 4,681,484, Cl. 406-63.000.

Intravascular Surgical Instruments, Inc.: *See*—
Kensey, Kenneth; and Nash, John, 4,681,106, Cl. 128-305.000.

Inuiya, Masafumi; and Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state image pickup device for producing color-separated video signals by use of afterimage rise-time. 4,682,212, Cl. 358-44.000.

Ippolito, Robert M.; and Vigmond, Stephen. Process for preparing certain 1-lower alkanoyl or benzoyl-4-(lower alkanoyl or benzoylmethylidene)-1,4-dihydropyridines or acid addition salts thereof. 4,681,944, Cl. 546-340.000.

Iqbal, Abul: *See*—
Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., 4,681,971, Cl. 558-414.000.

Irino, Etsuro, to Mitsubishi Denki Kabushiki Kaisha. Automobile telephone apparatus. 4,682,357, Cl. 379-356.000.

Irvin Industries, Inc.: *See*—
Lobanoff, Mark, 4,681,366, Cl. 297-191.000.

Irving, Edward: *See*—
Demmer, Christopher G.; and Irving, Edward, 4,681,923, Cl. 525-504.000.

Ishida, Matsuhiko: *See*—
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.

Ishiguro, Takeo: *See*—
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.

Ishihara, Hidetoshi: *See*—
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Ishikawa, Ken: *See*—
Horiba, Isao; and Ishikawa, Ken, 4,682,301, Cl. 364-724.000.

Ishikawa, Masakazu: *See*—
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.

Ishikawa, Takatoshi; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Method of processing silver halide color photographic material containing pyrazoloazole-type magenta coupler using a final bath containing a soluble iron salt. 4,681,835, Cl. 430-386.000.

Ishikawa, Tatsuo, to Kabushiki Kaisha Toshiba. Storage system. 4,682,305, Cl. 364-900.000.

Ishimoto, Shoji, to NEC Corporation. Output circuit with improved timing control circuit. 4,682,048, Cl. 307-269.000.

Ishimura, Naoya: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Ishitate, Yoshiyuki, to Fuji Xerox Co., Ltd. Optical recording device. 4,682,244, Cl. 358-287.000.

Ishizaka, Yukio: *See*—
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.

Ishizaki, Fumio: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.

Iso, Yoshimi: *See*—
Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, 4,682,314, Cl. 369-44.000.

Isonaga, Touichi: *See*—
Kutsumura, Shoji; and Isonaga, Touichi, 4,681,662, Cl. 202-270.000.

Itabashi, Yoshifumi: *See*—
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.

Itek Corporation: *See*—
Barrett, John R., 4,682,032, Cl. 250-352.000.

Ito, Hajime: *See*—
Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,154, Cl. 165-47.000.
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, to Ricoh Company, Ltd. Guidance device for manipulation of machine. 4,682,158, Cl. 340-679.000.
Ito, Takayasu: *See*—
Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, 4,682,096, Cl. 318-808.000.
Itoh, Kenji: *See*—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.
ITT Corporation: *See*—
Brooks, Forrest E., 4,682,163, Cl. 340-805.000.
Ivac Corporation: *See*—
Conero, Ronald S.; and Landis, Terry L., 4,680,977, Cl. 73-861.410.
Ivey, Charles W., to Fasco Industries, Inc. Combination heater-light-ventilator unit. 4,681,024, Cl. 98-34.600.
Iwakiri, Norio: *See*—
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.
Iwakura, Ken; and Sugiyama, Takekatsu, to Fuji Photo Film Co., Ltd. Recording materials. 4,682,193, Cl. 503-209.000.
Iwama, Teruhiko, to Nitsuko Limited. Simple data input apparatus. 4,682,014, Cl. 235-375.000.
Iwami, Tomoyuki, to International Business Machines Corp. Digital raster scan display system. 4,682,297, Cl. 364-521.000.
Iwasaki, Tetsuji, to Kao Corporation. Biocide activator. 4,681,900, Cl. 514-786.000.
Iwatsu Electric Co., Ltd.: *See*—
Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, 4,681,313, Cl. 271-273.000.
Izumita, Morishi: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
Izumiya, Shunzo: *See*—
Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, 4,681,997, Cl. 219-69.00C.
J. I. Case Company: *See*—
Ledermann, Donald L.; and Otten, Ronald L., 4,681,335, Cl. 280-446.00R.
J.M. Voith GmbH: *See*—
Elsner, Ernst, 4,680,986, Cl. 74-866.000.
Jacobs, Harvey C. Constant speed control for positive displacement variable stroke hydraulic motor. 4,680,931, Cl. 60-447.000.
Jagenberg Aktiengesellschaft: *See*—
Thievessen, Karl; and Weiss, Peter, 4,681,274, Cl. 242-58.300.
Jakob, Lothar. Loose-leaf binder for stacks of sheets. 4,681,473, Cl. 402-15.000.
James, David R., to James Industries Limited. Invalid hoists. 4,680,819, Cl. 5-86.000.
James Industries Limited: *See*—
James, David R., 4,680,819, Cl. 5-86.000.
James, James R., to Accuratio System Inc. Reaction injection molding pressure developing and balancing circuit. 4,681,137, Cl. 137-568.000.
James, Michael J., to Global Castors Limited. Dual-wheel casters with positive lock mechanism. 4,681,192, Cl. 188-1.120.
Jandy Industries: *See*—
Falconer, Ralph A., 4,681,139, Cl. 137-537.000.
Jansen, Rudolf, to Otto Junker GmbH. Charging sluice for annealing oven. 4,681,536, Cl. 432-59.000.
Japan Atomic Energy Research Institute: *See*—
Wakayama, Naoaki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.
Japan Aviation Elec.: *See*—
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
Japan Tobacco Company: *See*—
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.
Jatteau, Michel R.: *See*—
Martin, Guy N.; and Jatteau, Michel R., 4,682,033, Cl. 250-363.00R.
Jautelat, Manfred: *See*—
Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, 4,681,952, Cl. 549-61.000.
Jeal, Harvey P., to Avdel Limited. Method of making a self-locking blind fastener. 4,680,823, Cl. 10-86.00A.
Jenkins, Walter N.; and Davies, Gordon L., to National Research Development Corporation. Producing directed spray. 4,681,258, Cl. 239-66.000.
Jenkins, William D.: *See*—
Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., 4,681,600, Cl. 51-293.000.
Jensen, Marvin E.: *See*—
Tokarz, Joseph S.; and Jensen, Marvin E., 4,681,572, Cl. 604-329.000.
Jeol Ltd.: *See*—
Saito, Toshinori; and Takeuchi, Makoto, 4,681,513, Cl. 417-2.000.
Jeschke, Willi; Kipphan, Helmut; and Loffler, Gerhard, to Heidelberger Druckmaschinen AG. Method of determining the area coverage of a printed original or printing plate for printing presses. 4,681,455, Cl. 356-445.000.
Jester, Randy D., to American Hoechst Corporation. Calender band stripping section and process for stripping calendered sheet. 4,681,723, Cl. 264-175.000.
Jet Research Center, Inc.: *See*—
Regalbuto, John A., 4,681,037, Cl. 102-310.000.
Jidosha Kiki Co., Ltd.: *See*—
Masaka, Mitusuke, 4,682,008, Cl. 219-270.000.
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.
Suzuki, Yoshio; Sonoda, Hirotetu; and Yabe, Hideo, 4,681,184, Cl. 180-141.000.
Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., to PPG Industries, Inc. Preparation of amorphous, precipitated silica and siliceous filler-reinforced microporous polymeric separator. 4,681,750, Cl. 423-339.000.
Johnson, Harvey R., to Strain Measurement Devices Limited. Method of manufacture of strain gauges. 4,680,858, Cl. 29-610.0SG.
Johnson, James S.; and Albrecht, Gene A., to Honeywell Inc. Magnetic flux detector correction system. 4,680,866, Cl. 33-356.000.
Johnson & Johnson Dental Products, Company: *See*—
DeLuca, Robert D.; and Forbes-Jones, Robin M., 4,681,538, Cl. 433-9.000.
Johnson, Larry J.; Coates, Stephen R.; and Loor, Rueyming, to Cetus Corporation. Assay tray. 4,681,742, Cl. 422-102.000.
Johnson, Robert R., to Brown & Williamson Tobacco Corporation. Mouthpiece for tobacco smoke article. 4,681,125, Cl. 131-336.000.
Johnson, Samuel A., to Hewlett-Packard Company. Thermal ink jet print head method of manufacture. 4,680,859, Cl. 29-611.000.
Johnson, Virgil E., Jr., to Hydronautics, Incorporated. Enhancing liquid jet erosion. 4,681,264, Cl. 239-589.100.
Johnston, Mary H.: *See*—
Owen, Robert B.; and Johnston, Mary H., 4,681,437, Cl. 356-129.000.
Jokel, Isidore. Window intrusion barrier. 4,680,890, Cl. 49-55.000.
Jokela, Veikko: *See*—
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, 4,681,935, Cl. 536-56.000.
Jolley, Sue H.; and Jolley, William H. Storage pod. 4,681,361, Cl. 296-37.700.
Jolley, William H.: *See*—
Jolley, Sue H.; and Jolley, William H., 4,681,361, Cl. 296-37.700.
Jones, Edward J., to United States of America, Air Force. Active matching transmit/receive module. 4,682,176, Cl. 342-175.000.
Jones, G. Brian: *See*—
Ginzburg, Vladimir B.; and Jones, G. Brian, 4,680,978, Cl. 73-862.070.
Jones, James H.: *See*—
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.
Jones, Marshall G., to General Electric Company. High power laser energy delivery system. 4,681,396, Cl. 350-96.180.
Jones, Paul W.; and Bardue, Casey M., to Physio-Control Corporation. Medical instrument including electrodes adapted for right and left-handed use. 4,681,112, Cl. 128-419.00D.
Jujo, Akihiro: *See*—
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,680,830, Cl. 16-241.000.
Junk, Dieter; and Rauf, Richard, to Kleinewefers GmbH. Apparatus for rotating the shells of rolls in calenders or the like. 4,680,843, Cl. 29-116.00R.
Juwedor GmbH: *See*—
Eberle, Rudolf; Essert, Wilfried; and Kull, Herbert, 4,681,664, Cl. 204-9.000.
Juzi, Heniz; and Bernasconi, Marco L., to Sulzer Brothers Limited. Apparatus for uniformly distributing a two-phase mixture. 4,681,129, Cl. 137-154.000.
Kabashima, Shoshi: *See*—
Maruyama, Yoshio; and Kabashima, Shoshi, 4,681,528, Cl. 425-562.000.
Kabaya, Morihiro: *See*—
Fujino, Yukio; and Kabaya, Morihiro, 4,680,822, Cl. 5-421.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Teramae, Hiroshi; and Yoshimura, Yoshinari, 4,681,201, Cl. 192-106.200.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, 4,681,457, Cl. 366-84.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.
Kabushiki Kaisha Riken: *See*—
Shinada, Manabu, 4,681,817, Cl. 428-549.000.
Kabushiki Kaisha Swallow Ski: *See*—
Maruyama, Tetsuzo, 4,681,725, Cl. 264-46.500.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kubota, Kazuhisa; and Yasuda, Shigekazu, 4,681,435, Cl. 356-71.000.
Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,347, Cl. 280-804.000.
Kabushiki Kaisha Toshiba: *See*—
Hughes, Simon H. C., 4,682,111, Cl. 324-320.000.
Igarashi, Yosuke, 4,682,042, Cl. 250-578.000.

Ishikawa, Tatsuo, 4,682,305, Cl. 364-900.000.
Kubota, Mitsuru; and Amita, Kozo, 4,682,170, Cl. 340-928.000.
Kunii, Yutaka, 4,681,120, Cl. 128-660.000.
Kuroiwa, Akihiko, 4,682,094, Cl. 318-723.000.
Mori, Shojiro, 4,682,331, Cl. 371-25.000.
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,682,306, Cl. 365-222.000.
Takaoka, Takashi; Koyahara, Satoru; and Saito, Tetsuo, 4,682,321, Cl. 369-284.000.
Tamari, Masumi, 4,682,089, Cl. 318-568.000.
Tanimoto, Yasufumi, 4,681,425, Cl. 355-14.0CU.
Yamada, Kazuhiko, 4,682,271, Cl. 361-409.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.
Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, 4,680,963, Cl. 73-204.000.

Kadlec, Joseph, to Zenith Electronics Corporation. Monostable multivibrator for video display. 4,682,226, Cl. 358-148.000.

Kaempen, Charles E. Composite twine structure. 4,680,923, Cl. 57-251.000.

Kageyama, Takao; and Orui, Ryuzo, to NEC Corporation. Microwave tube with improved output signal extracting structure. 4,682,076, Cl. 315-4.000.

Kaji, Toshio, to Canon Kabushiki Kaisha. Color image sensing apparatus with one non-feedback clamp circuit and at least one feedback clamp circuit. 4,682,211, Cl. 358-41.000.

Kaji, Toshio: *See*—
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.

Kajita, Koji: *See*—
Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.

Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, to Asai Germanium Research Institute. Organogermanium compound. 4,681,960, Cl. 556-83.000.

Kakonyi, Gyula: *See*—
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , 4,682,137, Cl. 335-284.000.

Kali-Chemie Aktiengesellschaft: *See*—
Doetsch, Werner; and Siegel, Rudolf, 4,681,697, Cl. 252-175.000.

Kallenbach, Lyle R.: *See*—
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.

Kallin, Fredrik L. N.; and Evans, Edward R., to NCR Corporation. Thermal printing apparatus. 4,681,468, Cl. 400-120.000.

Kaltenbronn, James S.; and Stier, Michael A., to Warner-Lambert Company. Separation of diastereomers. 4,681,972, Cl. 560-29.000.

Kameoka, Kimitaka: *See*—
Inoue, Nobuaki; Inagaki, Yoshio; and Kameoka, Kimitaka, 4,681,836, Cl. 430-434.000.

Kamino, Yoshikazu: *See*—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.

Kamman, Daniel T., to Polaroid Corporation. Continuously cleaned rotary coating mask. 4,681,780, Cl. 427-282.000.

Kammerer, Gerd, to Dieter Grasslin Feinwerktechnik. Device for thermostatic valves, particularly for the temperature reduction of thermostat - controlled radiators. 4,681,254, Cl. 236-42.000.

Kamo, Takashi: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Kanaizumi, Masaru: *See*—
Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, 4,681,713, Cl. 264-41.000.

Kanbe, Junichiro: *See*—
Okada, Shinjiro; and Kanbe, Junichiro, 4,681,404, Cl. 350-350.00S.

Kanbe, Sadao: *See*—
Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.

Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, to Nitto Chemical Industry Co., Ltd. Stabilized fracturing fluid and method of stabilizing fracturing fluid. 4,681,690, Cl. 252-8.551.

Kanebo, Ltd.: *See*—
Satoh, Toshio; and Tsukamoto, Goro, 4,681,895, Cl. 514-535.000.

Kanegawa, Kiyoharu, to Rhythm Motor Parts Mfg. Co., Ltd. Ball joint socket. 4,681,475, Cl. 403-40.000.

Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, to Kuraray Co., Ltd. 3,4-dihydrobenzopyran compounds and pharmaceutical composition containing the same. 4,681,890, Cl. 514-333.000.

Kaneko, Atsumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Surveying instrument with image display unit. 4,682,218, Cl. 358-93.000.

Kaneko, Kenji, to Asahi Precision Co. Ltd. Automatic compensator for compensating collimation error due to two-directional inclination in surveying instruments. 4,681,438, Cl. 356-143.000.

Kaneko, Minoru: *See*—
Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.

Kaneko, Tadashi: *See*—
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.

Kaneta, Keisuke, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Method of controlling fuel injection. 4,681,079, Cl. 123-491.000.

Kaneyasu, Akira: *See*—
Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, 4,681,863, Cl. 501-108.000.

Kania, Charles M.: *See*—
Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.

Kanno, Akihiko: *See*—
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Kantor, Martin L., to USV Pharmaceutical Corporation. Direct n-acylation of amino acids. 4,681,973, Cl. 560-33.000.

Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., to International Business Machines Corporation. Compensation for fine line prints. 4,681,424, Cl. 355-14.00R.

Kanzaki, Nobuyoshi: *See*—
Kojima, Koichi; Fujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.

Kao Corporation: *See*—
Iwasaki, Tetsuji, 4,681,900, Cl. 514-786.000.

Kapples, Kevin J.: *See*—
Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., 4,681,879, Cl. 514-211.000.

Kapusta, Janusz J. Decorative, functional element for construction and the like. 4,681,481, Cl. 404-34.000.

Karabed, Razmik; and Mehrbians, Raphael. Holographic game cards. 4,681,324, Cl. 273-295.000.

Karam, Ronald E.: *See*—
Schulze, Harry O.; and Karam, Ronald E., 4,681,807, Cl. 428-403.000.

Karidis, John P., to International Business Machinces Corporation. Impact printing applications. 4,681,467, Cl. 400-124.000.

Karpati, Egon: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Karpisek, Ladislav S. Tubular conveyor. 4,681,214, Cl. 198-819.000.

Kassainee Zieger, Anna: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Kasugai, Kaoru: *See*—
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.

Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , to Elzett Muvek. Magnetising apparatus for the magnetisation of keys and rotors of magnetic safety lock systems. 4,682,137, Cl. 335-284.000.

Kataoka, Takashi: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Katayama, Hitoshi: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.

Katayama, Takashi: *See*—
Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.

Katayama, Toshiaki: *See*—
Koya, Yoshihiro; and Katayama, Toshiaki, 4,681,151, Cl. 164-76.100.

Kato, Kiichi: *See*—
Matsubayashi, Nobuhide; and Kato, Kiichi, 4,682,311, Cl. 369-13.000.

Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, to Canon Kabushiki Kaisha. Photographic optical apparatus. 4,682,237, Cl. 358-225.000.

Kato, Motosaburo: *See*—
Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.

Kato, Ryoichi: *See*—
Sakurai, Akio; and Kato, Ryoichi, 4,681,726, Cl. 376-171.000.

Kato, Shinichi: *See*—
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.

Kato, Takashi: *See*—
Shibanai, Ichiro; Horikoshi, Koki; and Kato, Takashi, 4,681,934, Cl. 536-46.000.

Katoh, Masao: *See*—
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.

Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Novel lysozyme-sensitive microorganism. 4,681,847, Cl. 435-172.300.

Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, to Research Association For Utilization of Light Oil. Catalyst for the production of aromatic hydrocarbons. 4,681,865, Cl. 502-74.000.

Katz, Carlos; Dima, Attila F.; and Eager, George S., Jr., to Cable Technology Laboratories, Inc. Premolded mechanically prestressed voltage stress control cones for high voltage cables and method of fabricating same. 4,681,985, Cl. 174-73.00R.

Kavli, Fred; and Park, Kyong, to Kavlico Corporation. Dual diaphragm differential pressure transducer. 4,680,971, Cl. 73-718.000.

Kavlico Corporation: *See*—
Kavli, Fred; and Park, Kyong, 4,680,971, Cl. 73-718.000.

Kawabata, Susumu: *See*—
Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.

Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuichi; and Matsumura, Susumu, to Canon Kabushiki Kaisha. Photo-electric converting device. 4,681,432, Cl. 356-4.000.

Kawabata, Takashi: *See*—
Sakai, Shinji; and Kawabata, Takashi, 4,681,419, Cl. 354-402.000.

Kawabe, Tadashi; and Kobune, Masafumi, to Tateho Kagaku Kogyo Kabushiki Kaisha. Electrically insulating filler for sheathed heaters. 4,681,862, Cl. 501-108.000.

Kawaharazaki, Takashi: *See*—
Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,347, Cl. 280-804.000.

Kawakami, Shigenobu: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.

Kawamura, Hideaki: *See*—
Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, 4,682,186, Cl. 346-140.00R.
Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishida, Hiroshi, 4,681,058, Cl. 114-271.000.
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.

Kawasaki Steel Corporation: *See*—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.
Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, 4,682,182, Cl. 346-1.100.

Kazakhsky Politekhnichesky Institute Imeni V.I. Lenina: *See*—
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

Kazama, Yasuo: *See*—
Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.

Kazmierski, Ronald J., to C. M. Smillie & Company. Cushioned clamp cylinder with proximity switches. 4,681,992, Cl. 200-82.00E.

Kearney-National, Inc.: *See*—
Osborne, Anthony, 4,681,990, Cl. 200-48.0KB.

Keck, Karl, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,681,200, Cl. 192-70.270.

Kee, Gene A.; and Hanna, Mark. One-person battering ram. 4,681,171, Cl. 173-90.000.

Kees, George, Jr., to Kees Surgical Specialty Co. Device for holding an aneurysm clip. 4,681,107, Cl. 128-325.000.

Kees Surgical Specialty Co.: *See*—
Kees, George, Jr., 4,681,107, Cl. 128-325.000.

Keller, Alfred: *See*—
Weitmann, Heinz; and Keller, Alfred, 4,680,965, Cl. 73-445.000.

Kemnitz, Tadeusz: *See*—
Moran, Michael J.; and Kemnitz, Tadeusz, 4,681,176, Cl. 177-114.000.

Kendall, Giles A.: *See*—
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.

Kenneally, Patrick: *See*—
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.

Kensey, Kenneth; and Nash, John, to Intravascular Surgical Instruments, Inc. Catheter based surgical methods and apparatus therefor. 4,681,106, Cl. 128-305.000.

Keppie, Dean A., to United Technologies Corporation. Dual spectra optical pyrometer having a serial array of photodectectors. 4,681,434, Cl. 356-45.000.

Keptel, Inc.: *See*—
Lynch, Daniel, 4,682,347, Cl. 379-29.000.

Kern & Co. AG.: *See*—
Aeschlimann, Heinz, 4,681,433, Cl. 356-5.000.

Kern, Josef, to Siemens Aktiengesellschaft. Electro-magnetic relay having two armatures. 4,682,133, Cl. 335-119.000.

Kernforschungsanlage Julich GmbH: *See*—
Mallener, Werner; and Overhoff, Theodor, 4,681,732, Cl. 376-337.000.

Kerry, Peter R.; and Lewis, Jeffrey L., to Koninklijke Emballage Industrie Van Leer B.V. Package filled with a water-soluble toxic pulverulent or granular product. 4,681,228, Cl. 206-484.000.

Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., to Aluminum Company of America. Aluminum alloy. 4,681,736, Cl. 420-535.000.

Kessler, Stephen B.: *See*—
Cho, George E. S.; and Kessler, Stephen B., 4,681,092, Cl. 128-1.00D.

Ketharanathan, Vettivetpillai. Biomaterial. 4,681,588, Cl. 623-11.000.

Kettler, Daniel G. A.: *See*—
d'Agostino, Guy; Dhainaut, Andre ; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.

Keve, Tibor: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Khashirov, Vladislav K.: *See*—
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

Khazhuer, Vladimir S.: *See*—
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

Kida, Takashi: *See*—
Kobari, Osamu; and Kida, Takashi, 4,681,535, Cl. 432-48.000.

Kidd, Roy E.: *See*—
Mussmann, Sara M.; and Kidd, Roy E., 4,682,157, Cl. 340-605.000.

Kihara, Seiji: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.

Kikendall, Garth D.: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.

Kikuchi, Masafumi, to Sony Corporation. Apparatus for controlling amplitude of vertical deflection signal. 4,682,087, Cl. 315-387.000.

Kikuta, Shigeru: *See*—
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.

Kim, Choong W. Supercavitation centrifugal pump. 4,681,508, Cl. 415-116.000.

Kim, Young B.: *See*—
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,682,246, Cl. 358-335.000.

Kinetics Technology International Corporation: *See*—
Spangler, Harvey D.; and Lamb, Kenneth V., 4,681,603, Cl. 55-27.000.

Kinugawa, Masumi: *See*—
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.

Kioritz Corporation: *See*—
Nagashima, Akira, 4,681,608, Cl. 55-276.000.
Tasaki, Takanobu; and Nagashima, Akira, 4,681,188, Cl. 181-229.000.

Kipphan, Helmut: *See*—
Jeschke, Willi; Kipphan, Helmut; and Loffler, Gerhard, 4,681,455, Cl. 356-445.000.

Kirch, Otto; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Guide device for the workpiece of a sewing machine. 4,681,051, Cl. 112-306.000.

Kiriake, Masaharu: *See*—
Ueda, Yutaka; and Kiriake, Masaharu, 4,681,231, Cl. 209-656.000.

Kirkup, David: *See*—
Cook, Sanford L.; and Kirkup, David, 4,680,828, Cl. 16-90.000.

Kirschner, Michael; Rapp, Gunter; and Zechnall, Martin, to Robert Bosch GmbH. Pulse shaper for inductive transmitters. 4,682,049, Cl. 307-268.000.

Kishigami, Tomohisa: *See*—
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.

Kisling, James W., III, to NL Industries, Inc. Method and apparatus for running long tools into and out of a pressurized enclosure. 4,681,168, Cl. 166-381.000.

Kiss, Bela: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Kitano, Tatsuo. Shaped bodies of calcium silicate. 4,681,809, Cl. 428-428.000.

Kitano, Tomoyuki: *See*—
Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, 4,680,963, Cl. 73-204.000.

Kitatani, Katuzi: *See*—
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, 4,681,832, Cl. 430-115.000.

Kitchens, Doyle. Accessory for bass fishing boat. 4,681,219, Cl. 206-315.110.

Kito, Tutomu: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Klag, James P.: *See*—
Harris, William H.; Klag, James P.; and Lam, Joseph W., 4,681,041, Cl. 105-355.000.

Klautschek, Herwig: *See*—
Gradnitzer, Eckhard; and Klautschek, Herwig, 4,682,263, Cl. 361-31.000.

Kleemann, Eugene: *See*—
Decker, Oscar C., Jr.; and Kleemann, Eugene, 4,681,148, Cl. 152-431.000.

Kleinewefers GmbH: *See*—
Junk, Dieter; and Rauf, Richard, 4,680,843, Cl. 29-116.00R.

Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, to Godecke Aktiengesellschaft. 5-alkoxy-pyrido(4,3-d)pyrimidine derivatives. 4,681,881, Cl. 514-258.000.

Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, to Godecke Aktiengesellschaft. 4-alkoxy-pyrido[2,3-d]pyrimidine derivatives. 4,681,882, Cl. 514-258.000.

Kleinschroth, Jurgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, to Godecke Aktiengesellschaft. 5-oxo-pyrido[4,3-]pyrimidine derivatives. 4,681,885, Cl. 514-258.000.

Klenoff, Bruce: *See*—
Goldfarb, Jerry; and Klenoff, Bruce, 4,682,363, Cl. 381-74.000.

Klosowski, Jerome M.: *See*—
Lopes, William J.; and Klosowski, Jerome M., 4,681,714, Cl. 264-46.600.

Kluth, Daniel J.; and Engel, Gary L. Test system providing testing sites for logic circuits. 4,682,329, Cl. 371-15.000.

KM-Engineering AG: *See*—
Uehlinger, Werner H.; and Franek, Jozef T., 4,681,001, Cl. 83-37.000.

Knap, Florian J. Dental articulator and method. 4,681,539, Cl. 433-73.000.

Knape & Vogt Manufacturing Company: *See*—
Gronlund, Robert L.; and Stewart, John, 4,681,289, Cl. 248-224.400.

Knapp, Joseph A.: *See*—
Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., 4,681,739, Cl. 422-37.000.

Knoff, Bernd: *See*—
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Knol, Jan D.: *See*—
Bes, Richard F. T.; and Knol, Jan D., 4,681,632, Cl. 106-19.000.

Knox, Lewis. Method of chemical deodorization of articles and solutions used in medical and biological procedures. 4,681,575, Cl. 604-359.000.

Kobal, Gerd. Process for measuring sensory qualities and apparatus therefor. 4,681,121, Cl. 128-731.000.

Kobari, Osamu; and Kida, Takashi, to Toho Development Engineering Co., Ltd. Preheating mechanism for source metal for melt. 4,681,535, Cl. 432-48.000.

Kobayashi, Haruhiko; and Otani, Tadahiko, to Hitachi, Ltd. Air-fuel ratio controlling method and apparatus for an internal combustion engine. 4,681,077, Cl. 123-489.000.

Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, to Japan Tobacco Company. Stocker in reel supply apparatus. 4,681,505, Cl. 414-744.00R.

Kobayashi, Ikuya: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.

Kobayashi, Masaharu: *See*—
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.

Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, to Yokogawa Hokushin Electric Corporation. Electromagnetic flow meter converter. 4,680,973, Cl. 73-861.160.

Kobayashi, Yoshiki: *See*—
Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.

Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, to Sandoz Ltd. Use of thio isosteres of ergot peptide alkaloids as vasaconstrictors. 4,681,880, Cl. 514-250.000.

Kobler, Ingo; and Plantsch, Josef, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary offset printing machine system. 4,681,035, Cl. 101-217.000.

Kobune, Masafumi: *See*—
Kawabe, Tadashi; and Kobune, Masafumi, 4,681,862, Cl. 501-108.000.

Koch, Joachim, to Dragerwerk Aktiengesellschaft. Incubator for prematures and newborns. 4,681,090, Cl. 128-1.00B.

Koch Process Systems, Inc.: *See*—
O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., 4,681,612, Cl. 62-23.000.

Kocso, Illes: *See*—
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , 4,682,137, Cl. 335-284.000.

Kodaira, Takanori, to Canon Kabushiki Kaisha. Camera. 4,681,418, Cl. 354-288.000.

Kodaka, Yoshiro: *See*—
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, 4,681,406, Cl. 350-429.000.

Kodama, Eiji: *See*—
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.

Koelewijn, Rob, to GTE Valeron Corporation. End mill cutting tool and indexable insert therefor. 4,681,485, Cl. 407-42.000.

Koenig, Dean B. Aquatic ride. 4,681,550, Cl. 440-40.000.

Koga, Hitoshi: *See*—
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.

Kohler, Norbert: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.

Kohler, Wolfgang: *See*—
Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt, 4,681,034, Cl. 101-211.000.

Kohlpaintner, Georg: *See*—
Bienert, Horst; and Kohlpaintner, Georg, 4,681,364, Cl. 296-217.000.

Kohmoto, Mitsuo: *See*—
Okano, Minoru; and Kohmoto, Mitsuo, 4,682,268, Cl. 361-384.000.

Kohsaka, Fusao: *See*—
Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

Koike, Ichiro: *See*—
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.

Koike, Kihachiro: *See*—
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.

Koike, Yoshiharu: *See*—
Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, 4,681,813, Cl. 428-450.000.

Koike, Yuzuru: *See*—
Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyozo, 4,681,075, Cl. 123-339.000.

Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Method for etching electrode foils for an aluminium electrolytic capacitor. 4,681,672, Cl. 204-129.400.

Kojima, Kunio: *See*—
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, to Kyoritsu Seiki Corporation; and Hitachi Seiki Co., Ltd. Replaceable tool. 4,680,999, Cl. 82-36.00B.

Koken, Claus, to U.S. Philips Corporation. Logarithmic potentiometer circuit. 4,682,099, Cl. 324-63.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See*—
Uemura, Isamu; and Yamamoto, Kazumasa, 4,681,357, Cl. 292-336.300.

Kolanowski, Clarence: *See*—
Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., 4,680,841, Cl. 29-33.00M.

Kolb, Richard P.: *See*—
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., 4,681,056, Cl. 114-146.000.

Kolbus GmbH & Co. KG: *See*—
Rathert, Horst; Grannemann, Gerhard; and Erdboris, Ulrich, 4,681,500, Cl. 412-33.000.

Kollmorgen Technologies Corporation: *See*—
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.

Kolner, Brian H.: *See*—
Bloom, David M.; and Kolner, Brian H., 4,681,449, Cl. 356-364.000.

Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of joining Ni-base heat resisting alloys. 4,681,251, Cl. 228-208.000.

Komori, Mikio: *See*—
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.

Komura, Fuminobu: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.

Kon, Toshiharu, to Nikkai Kensetsu Kabushiki Kaisha; and O.S.E. Kabushiki Kaisha. Method of stud welding and welding gun used therefor. 4,681,998, Cl. 219-99.000.

Konda, Ryuji, to Fuji Photo Film Co., Ltd. Solid-state image pickup device with photographic sensitivity characteristics. 4,682,203, Cl. 357-51.000.

Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, to Toyota Jidosha Kabushiki Kaisha. Method for joining a fiber-reinforced plastic structure. 4,681,647, Cl. 156-172.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Vapor phase soldering apparatus. 4,681,249, Cl. 228-37.000.

Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, to Sagami Chemical Research Center. Process for preparing dihalovinylcyclopropanecarboxylates. 4,681,953, Cl. 549-65.000.

Kondo, Tadashi; and Yabe, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Spring operating mechanism for an electrical switch. 4,681,993, Cl. 200-153.0SC.

Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Kerry, Peter R.; and Lewis, Jeffrey L., 4,681,228, Cl. 206-484.000.

Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, to Nitto Electric Industrial Co., Ltd.: Mazda Motor Corporation. Process for fixing alloy powder molding at sintering. 4,681,733, Cl. 419-8.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Maehashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.

Konno, Hidetaka: *See*—
Leidheiser, Henry, Jr.; and Konno, Hidetaka, 4,681,814, Cl. 428-457.000.

Konstruktiva Trencin, narodny podnik: *See*—
Brychta, Ondrej; and Zabrodsky, Vladimir, 4,681,100, Cl. 128-204.250.

Kontron Inc.: *See*—
Cho, George E. S.; and Kessler, Stephen B., 4,681,092, Cl. 128-1.00D.

Kooy, Hermen. Cabinet for cut-off flowers. 4,680,942, Cl. 62-256.000.

Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; and Farrall, George A., 4,680,840, Cl. 29-25.350.

Kornylak, Andrew T., to Omniquest, Inc. Multi-track gravity conveyor. 4,681,203, Cl. 193-35.00R.

Korthaus, Helmut: *See*—
Wilke, Richard; and Korthaus, Helmut, 4,680,982, Cl. 74-424.80R.

Kosch, Delmar D., to Weldmatic Patents, Inc. Welding wire dispenser. 4,681,277, Cl. 242-156.200.

Koshizuka, Kunihiro: *See*—
Maehashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, 4,681,796, Cl. 428-212.000.

Kosmas, Nikolaos. Bobbin in run-out detector, and a bobbin changing mechanism incorporating the detector. 4,681,050, Cl. 112-278.000.

Koster, William H.: *See*—
Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., 4,681,937, Cl. 540-355.000.

Kosugi, Masao, to Canon Kabushiki Kaisha. Projection exposure apparatus having an alignment light of a wavelength other than that of the exposure light. 4,682,037, Cl. 250-548.000.

Kosulic, Kenneth F.: *See*—
Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.

Kotoh, Keigo; and Nakamura, Nobuhiro, to Mitsubishi Denki Kabushiki Kaisha. Radar responder. 4,682,173, Cl. 342-51.000.

Kottgen, Eckart U.: *See*—
Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,681,844, Cl. 435-68.000.

Kotwicki, Allan J.: *See*—
Henry, Kenneth J.; and Kotwicki, Allan J., 4,680,959, Cl. 73-117.000.

Kounou, Tadami: *See*—
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

Kousek, Heinz: *See*—
Vollmer, Helmut; Kousek, Heinz; and Maier, Elmar, 4,681,493, Cl. 411-8.000.

Kovacs, Attila: *See*—
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto ; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.

Koya, Yoshihiro; and Katayama, Toshiaki, to Mitsubishi Chemical Industries Limited. Method for production of fiber-reinforced metal composite material. 4,681,151, Cl. 164-76.100.

Koyahara, Satoru: *See*—
Takaoka, Takashi; Koyahara, Satoru; and Saito, Tetsuo, 4,682,321, Cl. 369-284.000.

Kramer, Peter B., to Ortho Diagnostic Systems Inc. Fluorescence polarization immunoassay for heavy antigens. 4,681,859, Cl. 436-501.000.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for correcting the flight path of a missile. 4,681,283, Cl. 244-3.220.

Krautkramer-Branson, Incorporated: *See*—
Rost, Manfred, 4,680,967, Cl. 73-628.000.

Kredo, Theodore A., to Garrett Corporation, The. Lightweight, compact heat exchanger. 4,681,155, Cl. 165-76.000.

Kreeft, Hendrik K.: *See*—
Duurland, Jozef M.; Bos, Sinnighe J.; and Kreeft, Hendrik K., 4,681,280, Cl. 242-199.000.

Krewalk, John J.; and Silverberg, Eric C., to Bausch & Lomb Incorporated. Telescope control system. 4,682,091, Cl. 318-685.000.

Krieg, John: *See*—
Press, Irving D.; and Krieg, John, 4,681,349, Cl. 285-55.000.

Krisiloff, Steven. Dry sump lubrication system for an internal combustion engine. 4,681,189, Cl. 184-6.130.

Krivak, Thomas G.: *See*—
Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., 4,681,750, Cl. 423-339.000.

Krix, Wilfried: *See*—
Scharf, Helmut; and Krix, Wilfried, 4,681,046, Cl. 110-346.000.

Kroger, Harry: *See*—
Potter, Curtis N.; and Kroger, Harry, 4,681,666, Cl. 204-15.000.

Kruckenberg, Winfried; Leverenz, Klaus; and Otten, Hans-Gunter, to Bayer Aktiengesellschaft. Benzoisothiazole azo dyestuffs. 4,681,932, Cl. 534-575.000.

Kruger, Kurt J.; and Miller, Lester, to Dart Industries Inc. Electrical connector system. 4,681,385, Cl. 439-252.000.

Krupp Polysius AG: *See*—
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,681,021, Cl. 91-178.000.

Kryscyk, Robert, to Deere & Company. Variable length link for a three-point hitch. 4,681,336, Cl. 280-482.000.

Kubicek, Donald H.: *See*—
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.

Kubo, Isoroku, to Cummins Engine Company, Inc. Gas lubricated piston ring assembly. 4,681,326, Cl. 277-27.000.

Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid brake control system with operational mode control and method therefor. 4,682,295, Cl. 364-426.000.

Kubo, Yutaka: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.

Kubota, Kazuhisa; and Yasuda, Shigekazu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Contact pattern observation apparatus. 4,681,435, Cl. 356-71.000.

Kubota, Ltd.: *See*—
Mouri, Akihiko; and Ikeda, Kazushige, 4,680,929, Cl. 60-368.000.
Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,154, Cl. 165-47.000.

Kubota, Mitsuru; and Amita, Kozo, to Kabushiki Kaisha Toshiba. Apparatus for collecting toll. 4,682,170, Cl. 340-928.000.

Kubota, Naohiro; and Nishimura, Atsushi, to Adeka Argus Chemical Co., Ltd. Stabilizer compositions for synthetic resins imparting improved light stability. 4,681,905, Cl. 524-91.000.

Kubota, Yasuhiko: *See*—
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.

Kuehn, Judson S.: *See*—
Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.

Kuh, Louis M.; and Lampe, Robert C., to Olin Corporation. Water processor having automatic shutoff and bypass means. 4,681,677, Cl. 210-88.000.

Kuhl, Edward W.: *See*—
Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., 4,681,704, Cl. 252-546.000.

Kuhnel, Donald S.; and Ottenstein, Sidney A., to Innovative Controls, Incorporated. High intensity discharge lamp self-adjusting ballast system sensitive to the radiant energy or heat of the lamp. 4,682,084, Cl. 315-307.000.

Kuhrdt, Gunther, to Licentia Patent-Verwaltungs-GmbH. Antenna system for a flying body for jamming radio transmitting and receiving devices. 4,682,172, Cl. 342-15.000.

Kukes, Simon G.; and Parrott, Stephen L., to Phillips Petroleum Company. Catalyst for hydrofining of oil and process for preparing the catalyst. 4,681,869, Cl. 502-349.000.

Kull, Herbert: *See*—
Eberle, Rudolf; Essert, Wilfried; and Kull, Herbert, 4,681,664, Cl. 204-9.000.

Kumasaka, Alan J.: *See*—
Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., 4,682,153, Cl. 340-507.000.

Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, to Saint-Gobain Vitrage. Adhesive connection between the marginal area of a glass pane and a window frame. 4,681,794, Cl. 428-188.000.

Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, to Hoffmann-La Roche Inc.; and Takeda Chemical Industries Ltd. Immune interferon and a method for its extraction and purification. 4,681,930, Cl. 530-351.000.

Kunii, Yutaka, to Kabushiki Kaisha Toshiba. Ultrasonic diagnosing apparatus. 4,681,120, Cl. 128-660.000.

Kunishi, Shinsuke: *See*—
Fukishima, Minoru; and Kunishi, Shinsuke, 4,681,393, Cl. 439-851.000.

Kunz, Peter, to Ludwig Boschert GmbH & Co. KG. Coupling for rotatably connecting a reel with a drive shaft. 4,681,478, Cl. 403-341.000.

Kuo, Jung-Tsan. Electrical automobile plug. 4,682,139, Cl. 337-186.000.

Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Multi-lamp laser pumping cavity. 4,682,338, Cl. 372-72.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Tube transfer device. 4,681,230, Cl. 209-615.000.

Kuraray Co., Ltd.: *See*—
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Endo, Hiroshi; Katoh, Masao; and Hino, Kuniaki, 4,681,764, Cl. 424-125.000.
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.
Yamauchi, Takashi; Hayashi, Shoichiro; and Sasakawa, Atsushi, 4,681,978, Cl. 562-413.000.

Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Suction gas heater control device for engines. 4,681,070, Cl. 123-179.00H.

Kurimoto Ltd.: *See*—
Arakawa, Kazuaki, 4,681,269, Cl. 241-101.200.

Kuroiwa, Akihiko, to Kabushiki Kaisha Toshiba. Control system for a power converter driving a synchronous motor. 4,682,094, Cl. 318-723.000.

Kurt Wolf & Co. KG: *See*—
Andre, Wolfram K.; and Wolf, Kurt, 4,682,013, Cl. 219-497.000.
Andre, Wolfram K., 4,682,298, Cl. 364-557.000.
Wolf, Kurt; and Andre, Wolfram K., 4,682,012, Cl. 219-490.000.

Kusama, Tsuneo: *See*—
Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneo, 4,681,856, Cl. 536-53.000.

Kutsumura, Shoji; and Isonaga, Touichi, to Nippon Steel Corp.; and Fujicar Manu. Co. Ltd. Hot coke bucket and bucket car assembly. 4,681,662, Cl. 202-270.000.

Kuwano, Yukinori: *See*—
Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, 4,681,826, Cl. 430-65.000.

Kuwasawa, Mitsuru: *See*—
Ikeda, Yoshiaki; and Kuwasawa, Mitsuru, 4,682,167, Cl. 340-825.230.

Kyocera Corporation: *See*—
Saito, Akira, 4,681,861, Cl. 501-89.000.

Kyodo Printing Co., Ltd.: *See*—
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.

Kyomasu, Mikio, to Ricoh Company Ltd. Input buffer circuit. 4,682,052, Cl. 307-361.000.

Kyoritsu Seiki Corporation: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,681,847, Cl. 435-172.300.

Kyushu Refractories Co., Ltd.: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.

L. & C. Steinmuller GmbH: *See*—
Michalak, Stanislaw; Weber, Klaus-Dieter; and Meier, Jurgen, 4,681,746, Cl. 423-239.000.

L. Schuler GmbH: *See*—
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.
Schneider, Franz; Braitinger, Helmut; and Feinauer, Otto, 4,682,280, Cl. 364-191.000.

La Telemecanique Electrique: *See*—
Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.

Laboratorio Farmaceutico Lafarma S.a.S.: *See*—
Melillo, Gaetano, 4,681,752, Cl. 424-453.000.

Lacy, Donald D. Attachment for remote control of a plurality of signal monitors. 4,682,164, Cl. 340-825.030.

Ladet, Michel: *See*—
Guillermet, Robert; Ladet, Michel; Laslaz, Gerard; and Le Bars, Claude, 4,681,665, Cl. 204-14.100.

Lafer, William: *See*—
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.

Lai, Winston. Collapsible golf cart with one-step folding operation. 4,681,341, Cl. 280-646.000.

Laine, David J.: *See*—
Sloan, George C.; and Laine, David J., 4,680,817, Cl. 4-663.000.

Lair Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard, 4,682,005, Cl. 219-121.0PM.

Lam, Joseph W.: *See*—
Harris, William H.; Klag, James P.; and Lam, Joseph W., 4,681,041, Cl. 105-355.000.

Lamb, Kenneth V.: *See*—
Spangler, Harvey D.; and Lamb, Kenneth V., 4,681,603, Cl. 55-27.000.

Lambrecht, Richard M.: *See*—
Mirzadeh, Saed; and Lambrecht, Richard M., 4,681,727, Cl. 376-198.000.

Lampe, Robert C.: *See*—
Kuh, Louis M.; and Lampe, Robert C., 4,681,677, Cl. 210-88.000.

Lance Wire and Cable, Inc.: *See*—
Boulanger, Edward, 4,681,386, Cl. 439-347.000.

Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, to Siemens Aktiengesellschaft. Dental handpiece arrangement. 4,681,540, Cl. 433-126.000.

Landis, Terry L.: *See*—
Conero, Ronald S.; and Landis, Terry L., 4,680,977, Cl. 73-861.410.

Landreneau, Michael D. Catheter assembly having balloon extended flow path. 4,681,564, Cl. 604-97.000.

Lange, Gerhard, to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft. Process and apparatus for the production of oval chain links from round wire. 4,680,926, Cl. 59-27.000.

Langen, Jacobus J., to H. J. Langen & Sons Limited. Meat tenderizing needle. 4,680,832, Cl. 17-25.000.

Lantzsch, Reinhard; Arlt, Dieter; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Intermediates in the preparation of 2,2-dimethyl-3-aryl-cyclopropanecarboxylic acids and esters. 4,681,952, Cl. 549-61.000.

LaPan, Theodore T. Split vapor/liquid fuel supply system for internal combustion engines. 4,681,081, Cl. 123-522.000.

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Lardner, George E., to Halkey-Roberts Corporation. Check valve with preset cracking pressure. 4,681,132, Cl. 137-271.000.

Larson, James R.; and Trout, Torence J., to Du Pont de Nemours, E. I., and Company. Chargeable resins for liquid electrostatic developers comprising partial ester of 3-hydroxypropanesulfonic acid. 4,681,831, Cl. 430-114.000.

Larson, Lawrence E., to Hughes Aircraft Company. High resolution pipelined digital-to-analog converter. 4,682,149, Cl. 340-347.0DA.

LaRue, Philip R., to Naphs, Inc. Screwdriver. 4,680,995, Cl. 81-437.000.

Laser Corporation of America: *See*—
Locke, Edward V., 4,682,001, Cl. 219-121.0LC.

Laskaris, Evangelos T., to General Electric Company. Conical, unimpregnated winding for MR magnets. 4,682,134, Cl. 335-216.000.

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Lattion, Andre : *See*—
Bischofberger, Jurg; and Lattion, Andre , 4,680,925, Cl. 57-263.000.

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Belbel, Elie; Bataille, Christian; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,682,132, Cl. 335-14.000.

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Laurent, Jean: *See*—
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Lay, William C., to Grand Slam, Inc. Ball hitting practice device. 4,681,318, Cl. 273-26.00R.

Lazarus, Michel, to Thomson CSF. Frequency modulated continuous wave radar and application thereof to a altimetric probe. 4,682,175, Cl. 342-165.000.

Leacock, James R.: *See*—
Dawson, Brian D.; and Leacock, James R., 4,682,348, Cl. 379-37.000.

LeaRonal, Inc.: *See*—
Brasch, William R., 4,681,630, Cl. 106-1.110.
Nobel, Fred I.; and Schram, David N., 4,681,670, Cl. 204-44.400.

Leaseburge, Emory J.; and Melda, Kenneth J., to Combustion Engineering, Inc. Sample dilution system for supercritical fluid chromatography. 4,681,678, Cl. 210-101.000.

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Lechner, Paula. Surgical prep block and surgical assist block. 4,681,309, Cl. 269-328.000.

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Ledbetter, Frank E., III: *See*—
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.

Ledermann, Donald L.; and Otten, Ronald L., to J. I. Case Company. Center pivot hitch assembly. 4,681,335, Cl. 280-446.00R.

Lee, Arnold St. J. System, apparatus and method for gathering physiological data. 4,681,098, Cl. 128-630.000.

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Legg, Gene A., to Alcan Aluminum Corporation. Method of setting up rotary slitter tooling. 4,680,851, Cl. 29-433.000.
Lehigh University: *See*—
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Leidel, Dieter S.; Eirich, Hubert; Eirich, Paul; and Eirich, Walter. Method of regenerating old casting sand. 4,681,267, Cl. 241-23.000.
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Leisman, Thomas; and Huston, Jon, to Dynavac, Inc. Escape chute. 4,681,186, Cl. 182-47.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Fathman, C. Garrison, 4,681,760, Cl. 424-85.000.
Lem S.A.: *See*—
Cattaneo, Pierre, 4,682,101, Cl. 324-117.00H.
Lembke, Herbert, to Mannesmann Rexroth GmbH. Control motor for a servo valve. 4,682,063, Cl. 310-29.000.
Lemelson, Jerome H. Contact lens containing light sensitive material. 4,681,412, Cl. 351-162.000.
Lemelson, Jerome H. Audio visual apparatus and method. 4,681,548, Cl. 434-311.000.
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Leonard, Daniel F. Auxiliary dumping apparatus for vehicles. 4,681,371, Cl. 298-1.00A.
Leonard, George H., to Airpot Corporation. Socket construction for torsion member. 4,681,307, Cl. 267-154.000.
Leonard, Paul A. Cooling apparatus for a gas transmission system. 4,681,156, Cl. 165-124.000.
Leonhard, Bernhard: *See*—
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Leslie, James B., to Rodime PLC. Servo positioning system for disk drive system. 4,682,253, Cl. 360-77.000.
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Letinski, John S., to Celanese Corporation. Process for the preparation of polybenzimidazole foams. 4,681,716, Cl. 264-53.000.
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Bach, David T.; Gruenke, Roger A.; and Levin, Herman W., 4,681,443, Cl. 356-246.000.
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Kerry, Peter R.; and Lewis, Jeffrey L., 4,681,228, Cl. 206-484.000.
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Kuhrdt, Gunther, 4,682,172, Cl. 342-15.000.
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Riml, Peter, 4,681,376, Cl. 305-10.000.
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Lilley, Arthur W.: *See*—
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Smith, Daniel P.; and Lillquist, Robert D., 4,682,222, Cl. 358-113.000.
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Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.
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Chen, Chin-Chi; and Lin, Yung-Shing, 4,681,321, Cl. 273-167.00H.
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Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, 4,682,130, Cl. 333-195.000.
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Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., 4,682,153, Cl. 340-507.000.
Lindner, Harald: *See*—
Forster, Hilmar; and Lindner, Harald, 4,681,235, Cl. 213-50.000.
Lindsay, Thomas A.; and Morton, Randall E., to Eldec Corporation. Time-domain intensity normalization for fiber optic sensing. 4,681,395, Cl. 350-96.160.
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Lintott, Edward R., to Lucas Industries public limited company. Winding method. 4,680,857, Cl. 29-596.000.
Lipp, Robert, to California Devices, Inc. Gate array cell. 4,682,201, Cl. 357-42.000.
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Liska, Frank F.; and Liska, Frank T. Method and apparatus for producing engineered wood flakes, wafers or strands. 4,681,146, Cl. 144-369.000.
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Wolaver, Dan H.; and Little, Warren E., 4,682,116, Cl. 328-167.000.
Liu, Leland L., to Mobil Oil Corporation. Pigmented, heat-sealable coating composition for application to oriented polyolefin films. 4,681,803, Cl. 428-348.000.
Livingston, Peter M.; and Shelton, Jean C., to TRW Inc. Active mirror wavefront sensor. 4,682,025, Cl. 250-201.000.
Lloyd, Benjamin. Recording devices. 4,681,462, Cl. 368-69.000.
Lobanoff, Mark, to Irvin Industries, Inc. Vanity mirror or vehicle accessory assembly and mounting apparatus therefor. 4,681,366, Cl. 297-191.000.
Lockard, Joseph L., to AMP Incorporated. Electrical connector for transmission cable. 4,681,382, Cl. 439-92.000.
Locke, Edward V., to Laser Corporation of America. Multi-lead laser soldering apparatus. 4,682,001, Cl. 219-121.0LC.
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Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., 4,681,651, Cl. 156-382.000.
Farley, Harold C.; and Boles, Robert G., 4,681,013, Cl. 89-1.815.
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Mercado, Romeo I., 4,681,407, Cl. 350-471.000.
Lockyer, George D.: *See*—
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.
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Jeschke, Willi; Kipphan, Helmut; and Loffler, Gerhard, 4,681,455, Cl. 356-445.000.
Lohner, Martin; and Prestel, Fritz, to BSG-Schalttechnik GmbH & Co. KG. Rotary potentiometer with switch. 4,682,142, Cl. 338-172.000.
Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, to Regie Nationale des Usines Renault. Angular displacement pickup, particularly for the detection of torque in power steering. 4,682,104, Cl. 324-208.000.
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Bailey, James R.; and Long, Eric L., 4,681,398, Cl. 350-96.200.
Longhenry, Raymond L. Oriented array of self-locking fasteners. 4,681,222, Cl. 206-347.000.
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Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., 4,681,750, Cl. 423-339.000.
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Quarroz, Daniel, 4,681,942, Cl. 546-303.000.
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Johnson, Larry J.; Coates, Stephen R.; and Loor, Rueyming, 4,681,742, Cl. 422-102.000.

Loper, Roger K.; and Freeman, Richard A., to Rockwell International Corporation. Digital voice and data frequency modulation circuit. 4,682,123, Cl. 332-16.00R.

Lopes, William J.; and Klosowski, Jerome M., to Dow Corning Corporation. Multiple release mold coating. 4,681,714, Cl. 264-46.600.

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Gueret, Jean-Louis H., 4,681,127, Cl. 132-82.00R.

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Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich, 4,681,871, Cl. 514-15.000.

Lovell, Robert C. Packaging with cohesive coated materials. 4,680,918, Cl. 53-466.000.

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Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.

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Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.

Low, Sidney. Method and apparatus for sterilizing objects. 4,681,738, Cl. 422-28.000.

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Lintott, Edward R., 4,680,857, Cl. 29-596.000.

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Kunz, Peter, 4,681,478, Cl. 403-341.000.

Ludwig, Jurgen: *See*—
Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen, 4,681,931, Cl. 530-351.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Keck, Karl, 4,681,200, Cl. 192-70.270.
Maucher, Paul; and Friedmann, Oswald, 4,681,199, Cl. 192-70.230.

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Menzel, Waldemar, 4,680,944, Cl. 62-342.000.

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Lupke, Manfred A. A. Apparatus for molding thermoplastic pipes. 4,681,526, Cl. 425-532.000.

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Lynch, Daniel, to Keptel, Inc. Telephone line selection and isolation method and apparatus. 4,682,347, Cl. 379-29.000.

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Perlman, Stuart S.; Eisenhandler, Sanford; Lyons, Paul W.; and Shumila, Michael J., 4,682,230, Cl. 358-167.000.

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Kobler, Ingo; and Plantsch, Josef, 4,681,035, Cl. 101-217.000.

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Berger, Abe; and Vora, Rohitkumar H., 4,681,928, Cl. 528-353.000.

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Holland, George W.; Maag, Hans; and Rosen, Perry, 4,681,962, Cl. 556-441.000.

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Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.

Mae, Yoshiharu; and Oka, Tsutomu, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for preparing an ingot from metal scrap. 4,681,627, Cl. 75-10.190.

Maeda, Atsushi, to Mitsubishi Yuka Badische Co., Ltd. Process for producing cushioning laminate. 4,681,648, Cl. 156-210.000.

Maehashi, Tatsuichi; Abe, Takao; Koshizuka, Kunihiro; and Inaba, Yoshihiro, to Konishiroku Photo Industry Co., Ltd. Thermal transfer recording medium. 4,681,796, Cl. 428-212.000.

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Haardt, Henry; and Magdon, John, 4,681,295, Cl. 249-135.000.

Magilton, Thomas C., to Maytag Company, The. Panel alignment system. 4,682,267, Cl. 361-331.000.

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Diepeveen, Neal; and Bastian, Robert E., 4,682,029, Cl. 250-330.000.

Maguire, Sara B. Sheet bedding construction for institutional use. 4,680,821, Cl. 5-413.000.

Magyar Asvanyolaj es Foldgaz Kiserleti: *See*—
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto ; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.

Maier, Elmar: *See*—
Vollmer, Helmut; Kousek, Heinz; and Maier, Elmar, 4,681,493, Cl. 411-8.000.

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Ritter, Klaus; Michaelsen, Klaus; and Mair, Gunther, 4,681,328, Cl. 277-80.000.

Majerus, Howard J. Safety hold-down bar system. 4,681,344, Cl. 280-751.000.

Maki, Fumio: *See*—
Sato, Akira; and Maki, Fumio, 4,681,026, Cl. 98-115.200.

Makino, Masayuki, to NEC Corporation. Cordless Telephone system. 4,682,351, Cl. 379-62.000.

Malani, Shrikant R.: *See*—
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.

Malcolm Nicol & Co.: *See*—
Colon, Herman; and Maletsky, Albert, 4,681,576, Cl. 604-361.000.

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Mallinson, Andrew M.; and Hoodless, Adrian H. W., to Ferranti, plc. Cathode ray tube display systems. 4,682,086, Cl. 315-371.000.

Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., to Westinghouse Electric Corp. Nuclear waste packaging facility. 4,681,706, Cl. 252-633.000.

Malone, Don, to University of Tennessee Research Corporation. Mobile vehicle for training skaters. 4,681,332, Cl. 280-87.02R.

Mann, Theo: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.

Mannesmann AG: *See*—
Bollerhey, Rolf, 4,681,607, Cl. 55-284.000.

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Soltysiak, Peter, 4,681,294, Cl. 248-613.000.

Mannesmann Rexroth GmbH: *See*—
Lembke, Herbert, 4,682,063, Cl. 310-29.000.

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Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
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Manns, Michael C.; and Roberts, Terry E., to Roman Products, Inc. Holder for container for liquid. 4,681,239, Cl. 220-408.000.

Manthey, Joseph W.: *See*—
Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, 4,681,828, Cl. 430-97.000.

Manville Corporation: *See*—
Hernandez, Kenneth J., 4,681,217, Cl. 206-141.000.

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Gill, Frederick A.; and Tocci, Mario P., 4,681,798, Cl. 428-215.000.

Mao, Mark H. K.: *See*—
Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., 4,681,704, Cl. 252-546.000.

Marais, Jean-Luc: *See*—
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Marche, Pierre, to U.S. Philips Corporation. Device for the detection and elimination of unwanted images created by the pyramidal IR dome. 4,681,282, Cl. 244-3.160.

Marchesi, Franco, to Rockwell-Rimoldi S.p.A. Structure of an upper hook provided with a hole and used in sewing machines for making overedge stitches. 4,681,047, Cl. 112-162.000.

Marhic, Gerard, to Lair Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Plasma welding or cutting torch provided with a nozzle cartridge. 4,682,005, Cl. 219-121.0PM.

Marhold, Albrecht, to Bayer Aktiengesellschaft. Benzo-fused fluorinated heterocyclic compounds and a process for their preparation. 4,681,955, Cl. 549-362.000.

Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., to Boliden Aktiebolag. Autogenous grinding method. 4,681,268, Cl. 241-24.000.

Marklund, Ulf P.: *See*—
Marklund, Olle E.; Elmlid, Carl-Gustaf; Marklund, Ulf P.; and Borell, Michael C., 4,681,268, Cl. 241-24.000.

Markusson, Lars O., to Santrade Limited. Cutting insert. 4,681,488, Cl. 407-114.000.

Markvart, Tomas; and Willoughby, Arthur F. W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the. Semiconductor solar cells. 4,681,983, Cl. 136-255.000.

Maroschak, Michael D.; Atchley, Frederick P.; and Everson, Douglas G., to Plastic Tubing Industries, Inc. Universal septic tank fitting. 4,681,684, Cl. 210-532.200.

Marples, Brian A.; and Stretton, Reginald J., to National Research Development Corporation. Antifungal utility of bile acids. 4,681,876, Cl. 514-182.000.

Marquardt, Rainer; Salzmann, Theodor; and Peppel, Michael, to Siemens Aktiengesellschaft. Procedure and device for detecting the non-conducting state of turn-off thyristors. 4,682,278, Cl. 363-58.000.

Marracino, Charles R.: *See*—
English, George A.; and Marracino, Charles R., 4,682,065, Cl. 310-90.000.

Marshall, David H.: *See—*
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

Marshall, J. Howard. Obtaining uniformity of response in analytical measurement in a neutron-capture-based on-line bulk-substance elemental-analyzer apparatus. 4,682,043, Cl. 250-358.100.

Marson, Ralph G.: *See—*
Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L., 4,681,436, Cl. 356-121.000.

Marti, Jaime S. Machine for positioning containers. 4,681,209, Cl. 198-392.000.

Martin, Donald E., to Rexnord Inc. Conveyor roller and bearing assembly with external support. 4,681,215, Cl. 198-843.000.

Martin, Guy N.; and Jatteau, Michel R., to U.S. Philips Corporation. Camera for detecting X and γ rays, whose scintillation block has an entrance window constituted by a mechanically stiff and low absorbing X and γ radiation support. 4,682,033, Cl. 250-363.00R.

Martin, John F.: *See—*
Simmonds, Robert C., Jr.; Crowell, Douglas H.; and Martin, John F., 4,681,650, Cl. 156-378.000.

Martin, Manfred: *See—*
Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.

Martner, John G. Ink jet method and apparatus utilizing a web of hot melt ink. 4,682,185, Cl. 346-140.00R.

Martner, John G. Ink jet method and apparatus utilizing grandular or hot melt ink. 4,682,187, Cl. 346-140.00R.

Martorana, Piero: *See—*
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.

Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, to Nippon Hoso Kyokai; and Hitachi, Ltd. Television camera tube device. 4,682,077, Cl. 315-14.000.

Maruyama, Tetsuzo, to Kabushiki Kaisha Swallow Ski. Injection skis and their process of manufacture. 4,681,725, Cl. 264-46.500.

Maruyama, Yoshio; and Kabashima, Shoshi, to Matsushita Electric Industrial Co., Ltd. Valve nozzle for injection molding. 4,681,528, Cl. 425-562.000.

Masai, Tetsuji: *See—*
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.

Masaka, Mitsuuke, to Jidosha Kiki Co., Ltd. Self-temperature control type glow plug. 4,682,008, Cl. 219-270.000.

Masaki, Kazuo: *See—*
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Maschinenfabrik Andritz Actiengesellschaft: *See—*
Sbaschnigg, Johann, 4,681,659, Cl. 162-360.100.

Mase, Toshiaki: *See—*
Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, 4,681,951, Cl. 549-214.000.

Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., to Phillips Petroleum Company. Method of particulating agglomerated catalyst materials. 4,681,266, Cl. 241-18.000.

Massachusetts Institute of Technology: *See—*
Schrock, Richard R., 4,681,956, Cl. 556-12.000.

Massey-Ferguson Services N.V.: *See—*
Brown, David J., 4,680,983, Cl. 74-474.000.

Masters, Edwin J.; and Ebaugh, Paul L. Syringe with safety sheath. 4,681,567, Cl. 604-198.000.

Masters, William E. Kayak frame section and method. 4,681,060, Cl. 114-347.000.

Masumoto, Isamu: *See—*
Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, 4,681,927, Cl. 528-232.000.

Mathes, Gene R.; and Protheroe, Robert L., to NCR Corporation. Data compression method and apparatus. 4,682,150, Cl. 340-347.0DD.

Mathevon, Paul: *See—*
Vere , Bernard; and Mathevon, Paul, 4,680,920, Cl. 53-525.000.

Mathey, Christoph: *See—*
Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoffl, Rainer, 4,681,017, Cl. 89-29.000.

Matkan, Josef; and Treleaven, Richard J., to Minnesota Mining and Manufacturing Company. Particles containing releasable fill material and method of making same. 4,681,806, Cl. 428-402.210.

MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG.: *See—*
Stolz, Hermann, 4,681,359, Cl. 294-81.210.

Matsuba, Kunihiro: *See—*
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.

Matsubayashi, Nobuhide; and Kato, Kiichi, to Olympus Optical Co., Ltd. Photomagnetic differential reproducing system. 4,682,311, Cl. 369-13.000.

Matsuda, Sakurako: *See—*
Nikaido, Masataka; and Matsuda, Sakurako, 4,681,007, Cl. 84-1.100.

Matsui, Fujio, to Fuji Jukogyo Kabushiki Kaisha. Charging system for an automotive engine. 4,682,097, Cl. 320-64.000.

Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, to Murata Kikai Kabushiki Kaisha. Yarn end finding apparatus. 4,681,271, Cl. 242-18.00R.

Matsui, Kiyohide: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.

Matsui, Nobuo: *See—*
Sato, Kiyoshi; and Matsui, Nobuo, 4,682,214, Cl. 358-55.000.

Matsumoto, Kunio; and Hirata, Tsutomu, to Toyo Jozo Kabushiki Kaisha. Enzymatic assay method. 4,681,841, Cl. 435-18.000.

Matsumoto, Yutaka: *See—*
Woeller, Fritz H.; and Matsumoto, Yutaka, 4,681,142, Cl. 137-614.180.

Matsumura, Susumu: *See—*
Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuichi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.

Matsumura, Yasuharu: *See—*
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,681,857, Cl. 436-78.000.

Matsunaga, Mitsuru: *See—*
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.

Matsuoka, Kensaku: *See—*
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.

Matsushima, Yuichi: *See—*
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.
Maruyama, Yoshio; and Kabashima, Shoshi, 4,681,528, Cl. 425-562.000.
Nikaido, Masataka; and Matsuda, Sakurako, 4,681,007, Cl. 84-1.100.
Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.
Uya, Masaru, 4,682,303, Cl. 364-788.000.

Matt, Heinz: *See—*
Brandl, Rudolf; and Matt, Heinz, 4,681,019, Cl. 89-33.040.

Matthews, Gordon H. Apparatus for automatically detecting and playing desired audio segments over a broadcast receiver. 4,682,370, Cl. 455-166.000.

Matunami, Nobuaki: *See—*
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for transmitting torque in motor vehicles. 4,681,199, Cl. 192-70.230.

Mauvieux, Christian: *See—*
Beuneche, Daniel; Mauvieux, Christian; and Amiet, Pierre, 4,681,730, Cl. 376-252.000.

Mawby, Harold S.; and Harris, Duane H., to White Consolidated Industries, Inc. Ice maker. 4,680,943, Cl. 62-300.000.

Max Kammerer GmbH: *See—*
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.

May, Colin J., to Motorola Inc. High-Q RF filter with printed circuit board mounting temperature compensated and impedance matched helical resonators. 4,682,131, Cl. 333-202.000.

May, John W.: *See—*
Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, 4,681,828, Cl. 430-97.000.

Mayer, Robert W.: *See—*
Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., 4,682,153, Cl. 340-507.000.

Mayer, Siegfried: *See—*
Griese, Klaus; Mayer, Siegfried; and Weigle, Dieter, 4,681,514, Cl. 417-213.000.

Maytag Company, The: *See—*
Magilton, Thomas C., 4,682,267, Cl. 361-331.000.

Mazda Motor Corporation: *See—*
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.

McBride, Donald G.: *See—*
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.

McCaffrey, Donald B.: *See—*
Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., 4,681,286, Cl. 244-129.500.

McCarten, Barry M.: *See—*
Harrison, William H.; Arakawa, Mitsuaki; and McCarten, Barry M., 4,682,125, Cl. 333-12.000.

McCloud, Hal E.: *See—*
Engelken, Robert D.; and McCloud, Hal E., 4,681,777, Cl. 427-87.000.

McClure, William L. Deep sea mining apparatus. 4,681,372, Cl. 299-8.000.

McConnell, T. Doyle. Device and method for decoding cylinder locks. 4,680,870, Cl. 33-540.000.

McCormack, John: *See—*
Benson, Keith; and McCormack, John, 4,682,261, Cl. 364-468.000.

McCully, Gerald R.: *See—*
Niemann, Ludwig C., 4,681,224, Cl. 206-423.000.

McCurry, Lynn E.: *See*—
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.

McDaniel, Carl V.: *See*—
Edwards, Grant C.; Gilson, Jean-Pierre; and McDaniel, Carl V., 4,681,864, Cl. 502-63.000.

McDaniel, Max P.; and Smith, Paul D., to Phillips Petroleum Company. Polymerization catalyst, method of making and use therefor. 4,681,866, Cl. 502-154.000.

McDaniel, Max P.: *See*—
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.

McDermed, John D., to Burroughs Wellcome Co. Fluoropheno-thiazine and pharmaceutical use. 4,681,878, Cl. 514-223.000.

McDermott, Evelyn C. Bundling device. 4,681,032, Cl. 100-34.000.

McDonald, James A.: *See*—
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.

McGovern, Lore H.; and Moore, Alix A., to Aplex Corporation. Feminine urinary device. 4,681,573, Cl. 604-329.000.

McGuire, Jeffrey C., to Genex Corporation. Phenylalanine ammonin lyase-producing microbial cells. 4,681,850, Cl. 435-254.000.

McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., to McIntosh, Kenneth B. Medication clock. 4,682,299, Cl. 364-569.000.

McIntosh, Ronald C.: *See*—
Purdy, Haydn V.; and McIntosh, Ronald C., 4,682,189, Cl. 364-523.000.

McLaughlin, Kevin L., to Motorola, Inc. BICMOS driver with output voltage swing enhancement. 4,682,054, Cl. 307-446.000.

McMaster, Harold A., to Glasstech, Inc. Glass sheet tempering method and furnace. 4,681,616, Cl. 65-114.000.

McMullin, Francis: *See*—
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, 4,682,093, Cl. 318-701.000.

McNamara, Dennis J.; and Cook, Phillip D., to Warner-Lambert Company. 4-amino-3-halo-2-pyridinone nucleoside and nucleotide compounds. 4,681,873, Cl. 514-50.000.

McNeilab, Inc.: *See*—
Troutner, Vernon H., 4,681,568, Cl. 604-250.000.

McPherson, James O.: *See*—
Efron, Edward; McPherson, James O.; and Kim, Young B., 4,682,246, Cl. 358-335.000.

MDC Vacuum Products Corporation: *See*—
Contin, Jose L., 4,681,329, Cl. 277-167.500.

MDS Health Group Limited: *See*—
Douglas, Donald J., 4,682,026, Cl. 250-288.000.

Mead Corporation, The: *See*—
Doerr, Erwin; and Wood, Prentice J., 4,681,252, Cl. 229-52.00B.

Meamber, Jon F. Rapid cooking apparatus for egg frying utensil. 4,681,027, Cl. 99-422.000.

Medicor Muyek: *See*—
Hiros, Laszlo; Banati, Gabor; and Lipscher, Ervin, 4,682,265, Cl. 361-231.000.

Meeker, John G. Woodkiln combustion device. 4,681,087, Cl. 126-126.000.

Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, to Richter Gedeon Vegyeszeti Gyar Rt. Pharmaceutical compositions with a neuroleptic action and process for preparing same. 4,681,887, Cl. 514-284.000.

Mehrbians, Raphael: *See*—
Karabed, Razmik; and Mehrbians, Raphael, 4,681,324, Cl. 273-295.000.

Meier, Jurgen: *See*—
Michalak, Stanislaw; Weber, Klaus-Dieter; and Meier, Jurgen, 4,681,746, Cl. 423-239.000.

Meiji Seika Kaisha Ltd.: *See*—
Adachi, Takashi; and Hidaka, Hidemasa, 4,681,771, Cl. 426-658.000.

Meinan Machinery Works, Inc.: *See*—
Nakaya, Takashi, 4,681,002, Cl. 83-71.000.

Meiser, Roland; Burkert, Josef; and Bendel, Ralf, to Thermotechnik G. Bauknecht GmbH; and Barlian, Reinhold. Wall mounted combined radiactive-convective electric space heater. 4,682,009, Cl. 219-377.000.

Melda, Kenneth J.: *See*—
Leaseburge, Emory J.; and Melda, Kenneth J., 4,681,678, Cl. 210-101.000.

Melillo, Gaetano, to Laboratorio Farmaceutico Lafarma S.a.S., a part interest. Capsules containing the active principle of an allergen, and process for their preparation. 4,681,752, Cl. 424-453.000.

Menault, Jacques: *See*—
Chion, Pierre; and Menault, Jacques, 4,681,594, Cl. 8-489.000.
Chion, Pierre; and Menault, Jacques, 4,681,595, Cl. 8-489.000.

Menzel, Waldemar, to Lumen GmbH Nahrmittel - und Maschinenfabrik. Apparatus for the preparation of ice cream, milkshakes, sorbet, frozen desserts and the like from a pumpable starting mixture. 4,680,944, Cl. 62-342.000.

Mercado, Romeo I., to Lockheed Missiles & Space Company, Inc. Two-glass photographic objective color-corrected at four wavelengths. 4,681,407, Cl. 350-471.000.

Merck & Co., Inc.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., to Hoffman-La Roche Inc. Prevention of N-nitroso compound formation in vivo. 4,681,756, Cl. 424-451.000.

Mertz, Denny W., to Emerson Electric Co. Adjustable pressure regulating solenoid valve. 4,681,297, Cl. 251-45.000.

Mesch, Keith A.; and Conroy, Gary M., to Morton Thiokol, Inc. Stabilizers for halogen-containing organic polymers comprising an organotin mercaptide and a diester of an unsaturated dicarboxylic acid. 4,681,907, Cl. 524-180.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Halldorsson, Thorsteinn; and Seiffarth, Ernst A., 4,682,024, Cl. 250-225.000.
Kranz, Walter, 4,681,283, Cl. 244-3.220.
Sodeikat, Dieter, 4,680,968, Cl. 73-651.000.

Messier-Hispano-Bugatti: *See*—
Veaux, Jacques; and Derrien, Michel, 4,681,284, Cl. 244-102.00R.

Metzeler Kautschuk GmbH: *See*—
Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, 4,681,306, Cl. 267-140.100.

Meuleman, Jean-Jacques: *See*—
Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, 4,682,294, Cl. 364-492.000.

Meurer, Wilhelm K. Seatbelt cutter. 4,680,861, Cl. 30-296.00A.

Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-pyrimidinylureas. 4,681,619, Cl. 71-92.000.

Michaelsen, Klaus: *See*—
Ritter, Klaus; Michaelsen, Klaus; and Mair, Gunther, 4,681,328, Cl. 277-80.000.

Michaely, William J.: *See*—
Lee, David L.; and Michaely, William J., 4,681,621, Cl. 71-103.000.

Michalak, Stanislaw; Weber, Klaus-Dieter; and Meier, Jurgen, to L. & C. Steinmuller GmbH. Method of regulating the amount of reducing agent added during catalytic reduction of NO_x contained in flue gases. 4,681,746, Cl. 423-239.000.

Michel, Jean, to Thomson -CSF. Class AB amplifier and a distortion corrector therefor. 4,682,119, Cl. 330-149.000.

Michikawa, Yuichi: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.

Michon, Gerald J.: *See*—
Burke, Hubert K.; and Michon, Gerald J., 4,681,440, Cl. 356-218.000.

Microcomputer Accessories, Inc.: *See*—
Hellman, Nat, III, 4,681,378, Cl. 312-108.000.

Microdot Inc.: *See*—
Berecz, Imre, 4,681,497, Cl. 411-377.000.

Microelectronics and Computer Technology Corporation: *See*—
Potter, Curtis N., 4,681,655, Cl. 156-632.000.
Potter, Curtis N.; and Kroger, Harry, 4,681,666, Cl. 204-15.000.

Midorikawa, Akira: *See*—
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Midorikawa, Mitsuhiro: *See*—
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.

Mietzner, Timothy A.; and Morse, Stephen A., to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University. Major iron-regulated protein of *Neisseria gonorrhoeae* and its use as vaccine. 4,681,761, Cl. 424-92.000.

Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion and process for production thereof. 4,681,838, Cl. 430-367.000.

Migliore, Neil. Method of installing marble panels. 4,680,914, Cl. 52-747.000.

Miguchi, Akio: *See*—
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.

Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, to Kabushiki Kaisha Komatsu Seisakusho; and Aoki Corporation. Apparatus for feeding bars through a bending or like processing station. 4,681,210, Cl. 198-468.200.

Miki, Yukio: *See*—
Taniguchi, Toshihiko; and Miki, Yukio, 4,682,273, Cl. 362-18.000.

Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, to Nitto Kohki Co., Ltd. Cushioning device for use with a pneumatic impact tool or the like. 4,681,172, Cl. 173-139.000.

Mikropul Corporation: *See*—
Heidinger, Alfred J.; and Duyckinck, Robert W., 4,681,676, Cl. 209-380.000.

Mikuni, Hajime: *See*—
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.

Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, to United States of America, Air Force. Electromagnet for programmable microwave circulator. 4,682,126, Cl. 333-81.00B.

Milkovic, Miran, to General Electric Company. Solid state watthour meter with switched-capacitor integration. 4,682,102, Cl. 324-142.000.

Millauer, Wolfgang; and Raab, Dieter, to Hilti Aktiengesellschaft. Process of forming openings. 4,681,489, Cl. 408-1.00R.

Miller, David, to Delta International Machinery Corp. Blade tensioning device for scroll saw. 4,681,006, Cl. 83-782.000.
Miller, Donald E., to Brazeway, Inc. Method of manufacturing lateral header extensions. 4,680,845, Cl. 29-157.00R.
Miller, Jack E., to Harry Major Machine & Tool Co. Accumulating conveyor. 4,681,212, Cl. 198-803.200.
Miller, Jack V. Low voltage lighting fixture with integral thermally controlled coaxial transformer. 4,682,276, Cl. 362-294.000.
Miller, Lester: *See*—
Kruger, Kurt J.; and Miller, Lester, 4,681,385, Cl. 439-252.000.
Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, to Ciba-Geigy Corporation. Production of sulfonated amines. 4,681,710, Cl. 260-508.000.
Miller, Robert L.: *See*—
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.
Millham, Ernest H., to International Business Machines Corporation. Hierarchical test system architecture. 4,682,330, Cl. 371-20.000.
Mimasu, Takeo; and Torii, Kuniyoshi, to Rilis Kagaku Kogyo Kabushiki Kaisha. Deodorant compositions containing persimmon juice as active ingredient. 4,681,757, Cl. 424-47.000.
Mimoto, Osamu: *See*—
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.
Mimura, Nobuharu: *See*—
Hasegawa, Junzo; Kawabata, Susumu; and Mimura, Nobuharu, 4,681,492, Cl. 409-231.000.
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, to Sasaki Glass Co., Ltd. Laser beam glass cutting. 4,682,003, Cl. 219-121.0LN.
Minch, Morris L.; and Wagner, Theodore W., to Siemens Corporation. Apparatus for transmitting and/or receiving balanced signals on a two-wire telecommunication line. 4,682,356, Cl. 379-347.000.
Minigrip, Incorporated: *See*—
Ausnit, Steven; and Bentsen, Per, 4,682,366, Cl. 383-65.000.
Ministry of International Trade and Industry: *See*—
Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koii, 4,680,618, Cl. 5-81.00R.
Minnesota Mining and Manufacturing Company: *See*—
Eian, Gilbert; and Cheney, Paul G., 4,681,801, Cl. 428-283.000.
Fong, James J., 4,681,790, Cl. 428-96.000.
Helland, Randall H.; and Burton, Craig A., 4,681,830, Cl. 430-110.000.
Matkan, Josef; and Treleaven, Richard J., 4,681,806, Cl. 428-402.210.
Minolta Camera Kabushiki Kaisha: *See*—
Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,681,825, Cl. 430-57.000.
Taniguchi, Toshihiko; and Miki, Yukio, 4,682,273, Cl. 362-18.000.
Minonzio, Luigi: *See*—
Lodispoto, Alberto, 4,681,114, Cl. 128-581.000.
Mirzadeh, Saed; and Lambrecht, Richard M., to United States of America, Energy. Process for producing astatine-211 for radiopharmaceutical use. 4,681,727, Cl. 376-198.000.
Misawa, Rintaro, to Sunwa Sharyo Manufacturing Co., Ltd. Hand truck. 4,681,330, Cl. 280-47.200.
Mischenko, Nicholas, to Motorola, Inc. Flex-lock dovetail mounting apparatus for radio transceivers and accessories. 4,681,476, Cl. 403-42.000.
Mishima, Tadaaki: *See*—
Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, 4,682,365, Cl. 382-14.000.
Mistry, Kantilal, to Blonder-Tongue Laboratories, Inc. Television picture and sound scrambler and method. 4,682,359, Cl. 380-7.000.
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, to Hitachi, Ltd. Apparatus for regenerating original signals. 4,682,115, Cl. 328-164.000.
Mitchell, Hal D.; and Walker, Donald R., to Figgie International Inc. Shoulder pad spring arch system. 4,680,814, Cl. 2-2.000.
Mitchell, Robert C.: *See*—
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.
Mitel Corporation: *See*—
Ramsay, John R.; and Styrna, Zbigniew B., 4,682,328, Cl. 371-13.000.
Mitsubishi Chemical Industries Limited: *See*—
Koya, Yoshihiro; and Katayama, Toshiaki, 4,681,151, Cl. 164-76.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Goto, Shigeru; Asano, Masaru; Ishida, Matsuhiko; and Inoue, Shosaku, 4,681,207, Cl. 198-333.000.
Ikejima, Hiroyuki, 4,681,191, Cl. 187-119.000.
Irino, Etsuro, 4,682,357, Cl. 379-356.000.
Kondo, Tadashi; and Yabe, Kiyoshi, 4,681,993, Cl. 200-153.0SC.
Kotoh, Keigo; and Nakamura, Nobuhiro, 4,682,173, Cl. 342-51.000.
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.
Murai, Takashi, 4,680,935, Cl. 62-45.000.
Ochiai, Hajime; and Morihara, Kenji, 4,682,144, Cl. 340-48.000.
Onishi, Ken; and Sugiyama, Yasuo, 4,682,333, Cl. 371-39.000.
Sugita, Kazuhiko, 4,681,206, Cl. 198-328.000.
Toshiaki, Ishii, 4,681,190, Cl. 187-101.000.
Uetani, Kenichi, 4,682,342, Cl. 375-38.000.
Wakayama, Naoaki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.
Yoshida, Susumu, 4,681,982, Cl. 136-249.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, 4,681,927, Cl. 528-232.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.
Watabe, Shin, 4,682,279, Cl. 364-141.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Mae, Yoshiharu; and Oka, Tsutomu, 4,681,627, Cl. 75-10.190.
Mitsubishi Monsanto Chemical Company: *See*—
Hasegawa, Ryuichi; and Hayashi, Kohji, 4,681,975, Cl. 560-90.000.
Mitsubishi Yuka Badische Co., Ltd.: *See*—
Maeda, Atsushi, 4,681,648, Cl. 156-210.000.
Mitsudoh, Makoto: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.
Mitsui, Akio; and Ohta, Noboru, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,681,837, Cl. 430-504.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.
Mitsumoto, Kinya: *See*—
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.
Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, to Toyo Boseki Kabushiki Kaisha. Method of making a hollow fiber membrane for dialysis. 4,681,713, Cl. 264-41.000.
Miyake Hitomi: *See*—
Tambe, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, 4,681,067, Cl. 123-41.100.
Miyake, Kazunari, to Sharp Kabushiki Kaisha. Disk storing system for disk player. 4,682,313, Cl. 369-39.000.
Miyake, Shinichi: *See*—
Ueba, Yoshinobu; and Miyake, Shinichi, 4,681,400, Cl. 350-96.340.
Miyashita, Satoru: *See*—
Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.
Miyawaki, Motohisa, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the transmission ratio in an infinitely variable transmission. 4,680,991, Cl. 74-868.000.
Mizuno, Hirotaka: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.
Mizuno, Tiaki: *See*—
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, to Nippondenso Co., Ltd. Electronic odometer. 4,682,287, Cl. 364-561.000.
Mizusawa Industrial Chemicals, Ltd.: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.
Mobil Oil Corporation: *See*—
Benoit, Gordon L.; and Boyd, Dana M., 4,681,721, Cl. 264-169.000.
Graven, Richard G.; and Zahner, John C., 4,681,674, Cl. 208-59.000.
Horodysky, Andrew G., 4,681,692, Cl. 252-32.500.
Liu, Leland L., 4,681,803, Cl. 428-348.000.
Pennison, Harold P., 4,681,158, Cl. 166-77.500.
Mochizuki, Takashi: *See*—
Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.
ModuForm, Inc.: *See*—
Gavin, F. Paul; Brigham, David F.; and Gavin, Ann H., 4,681,901, Cl. 521-54.000.
Moeller, Matthias, to Siemens Aktiengesellschaft. Solar cell comprising a semiconductor body formed of amorphous silicon and having a layer sequence p-SiC/i/n. 4,681,984, Cl. 136-258.000.
Mojden, Wallace W.; and Darr, Robert E., to Fleetwood Systems, Inc. Method of automatically de-bagging can ends and like articles. 4,681,507, Cl. 414-786.000.
Molee, Casper S.: *See*—
Winters, Arthur; and Molee, Casper S., 4,681,122, Cl. 128-736.000.
Molex Incorporated: *See*—
Fukishima, Minoru; and Kunishi, Shinsuke, 4,681,393, Cl. 439-851.000.
Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., 4,680,841, Cl. 29-33.00M.
Momma, Naohiro: *See*—
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.
Monaghan, Richard L.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.
Monarch Aviation, Inc.: *See*—
Perkins, John W., 4,680,891, Cl. 49-280.000.
Monarch Marking Systems, Inc.: *See*—
Duchin, Daniel, 4,681,248, Cl. 227-73.000.
Wisecup, David R., 4,680,836, Cl. 24-150.0FP.

Monogram Industries, Inc.: *See—*
Pratt, John D.; and Belanger, Victor, 4,681,494, Cl. 411-54.000.
Monroy, Enrique A., to Dentsply Research & Development Corp. Rapid denture technique. 4,681,543, Cl. 433-196.000.
Monsanto Company: *See—*
Gomez, I. Luis, 4,681,810, Cl. 428-429.000.
Monsell, Kurt, to Acme Electric Corporation. Battery charger spark suppressor. 4,682,262, Cl. 361-6.000.
Montres Rado S.A.: *See—*
Gogniat, Paul, 4,681,461, Cl. 368-69.000.
Montreuil, Philippe: *See—*
Duc, Michel; Montreuil, Philippe; and Meuleman, Jean-Jacques, 4,682,294, Cl. 364-492.000.
Moog, Inc.: *See—*
Tillman, Alfred J., 4,681,135, Cl. 137-489.500.
Moore, Alix A.: *See—*
McGovern, Lore H.; and Moore, Alix A., 4,681,573, Cl. 604-329.000.
Moore, Benjamin N.: *See—*
Drapeau, Donald F.; Moore, Benjamin N.; and Hall, Henry B., 4,682,010, Cl. 219-381.000.
Moos, Hans J.: *See—*
Simonsen, Jens K.; and Moos, Hans J., 4,680,974, Cl. 73-861.380.
Moose Industries, Inc.: *See—*
Boneta, Louis, 4,680,880, Cl. 37-236.000.
Moralez, Christopher M.: *See—*
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.
Moran, Michael J.; and Kemnitz, Tadeusz, to 501 USM Corporation. Product handling and weighing apparatus. 4,681,176, Cl. 177-114.000.
Morelli, Thomas A.: *See—*
Abolins, Visvaldis; and Morelli, Thomas A., 4,681,906, Cl. 524-166.000.
Mori, Akira: *See—*
Amazawa, Kiyoshi; and Mori, Akira, 4,682,045, Cl. 307-125.000.
Mori, Shojiro, to Kabushiki Kaisha Toshiba. Logic circuit with self-test. 4,682,331, Cl. 371-25.000.
Mori, Yasushi, to Nissan Motor Co., Ltd. Control for shock-free shift in an automatic transmission. 4,680,988, Cl. 74-866.000.
Morihara, Kenji: *See—*
Ochiai, Hajime; and Morihara, Kenji, 4,682,144, Cl. 340-48.000.
Morikane, Hiroyuki: *See—*
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, to Casio Computer Co., Ltd. Tone information processing device for an electronic musical instrument. 4,681,008, Cl. 84-1.280.
Morikubo, Kunio: *See—*
Nagasawa, Kohtaro; and Morikubo, Kunio, 4,681,833, Cl. 430-175.000.
Morimoto, Yoshihiko, to Fuji Jukogyo Kabushiki Kaisha. Control system for an infinitely variable transmission. 4,680,987, Cl. 74-866.000.
Morishige, Yuji: *See—*
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.
Morishima, Hideki: *See—*
Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, 4,681,465, Cl. 368-246.000.
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, to Mitsubishi Denki Kabushiki Kaisha. Planetary gear starter. 4,680,979, Cl. 74-7.00E.
Morishita, Tsuyoshi: *See—*
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.
Morita, Akiyoshi: *See—*
Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, 4,681,642, Cl. 148-321.000.
Moriya, Masamichi: *See—*
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
Moriyama, Jiro: *See—*
Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.
Morokuma, Hiroshi: *See—*
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.
Morris, Richard S. Aquatic device. 4,681,551, Cl. 441-76.000.
Morse, Stephen A.: *See—*
Mietzner, Timothy A.; and Morse, Stephen A., 4,681,761, Cl. 424-92.000.
Morton, Randall E.: *See—*
Lindsay, Thomas A.; and Morton, Randall E., 4,681,395, Cl. 350-96.160.
Morton Thiokol, Inc.: *See—*
Mesch, Keith A.; and Conroy, Gary M., 4,681,907, Cl. 524-180.000.
Mosimann, Walter: *See—*
Back, Gerhard; and Mosimann, Walter, 4,681,596, Cl. 8-620.000.
Motokawa, Isamu: *See—*
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.
Motorola, Inc.: *See—*
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.
Davis, Walter L., 4,682,165, Cl. 340-825.500.
May, Colin J., 4,682,131, Cl. 333-202.000.
McLaughlin, Kevin L., 4,682,054, Cl. 307-446.000.
Mischenko, Nicholas, 4,681,476, Cl. 403-42.000.
Richmond, Carl T.; and Lester, Joseph O., 4,682,174, Cl. 342-160.000.
Williams, Tim A., 4,682,302, Cl. 364-768.000.
Mouche, Richard J.; and Song, Peter, to Nalco Chemical Company. Use of alkali metal nitrites to inhibit H_2S formation in flue gas desulfurization system sludges. 4,681,687, Cl. 210-764.000.
Mouradian, James T. Neck apparatus for stringed musical instruments. 4,681,009, Cl. 84-293.000.
Mouri, Akihiko; and Ikeda, Kazushige, to Kubota, Ltd. Swivelling working vehicle. 4,680,929, Cl. 60-368.000.
Mowry, William H., Jr., to Standard Register Co., The. Financial document protection. 4,681,348, Cl. 283-58.000.
Moy, Jean P., to Thomson-CSF. Process for the temperature compensation of a photoconducting detector. 4,682,018, Cl. 250-211.00R.
Moyer, William D., to Automation Associates, Inc. Multiple part simultaneous forming apparatus. 4,680,842, Cl. 29-33.00P.
Muchowski, Joseph M.: *See—*
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.
Mueller, Richard A., to G. D. Searle & Co. 8-chlorodibenz[b,f][1,4]oxazepine-10-(11H)-carboxylic acid, 2-[(phenylthio)alkanoyl]hydrazides. 4,681,939, Cl. 540-547.000.
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, to L. Schuler GmbH. Gripping devices in idling stage areas of a transfer press. 4,680,954, Cl. 72-405.000.
Mueller, William H., to UOP Inc. Increased glucose levels in starch saccharification using immobilized amyloglucosidase. 4,681,845, Cl. 435-96.000.
Muhlhaus, Ludwig: *See—*
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, 4,681,157, Cl. 165-145.000.
Mulflur, W. Joseph; and Munson, James R., to Reagent Chemical & Research Company. Treatment of cooking oils and fats. 4,681,768, Cl. 426-417.000.
Muller, Adam; and Goller, Ernst, to H. Stoll GmbH & Co. Flat-bed knitting machine having a spool table. 4,680,946, Cl. 66-64.000.
Muller, Hans: *See—*
Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, 4,681,306, Cl. 267-140.100.
Muller, Hans-Martin, to Robert Bosch GmbH. Electronically controlled fuel injection system for an internal combustion engine. 4,681,076, Cl. 123-488.000.
Mullins, Ronald L.: *See—*
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,680,899, Cl. 51-427.000.
Mundo, Charles J., Jr.: *See—*
Sims, John C., deceased; and Mundo, Charles J., Jr., 4,681,431, Cl. 356-4.000.
Munnell, Jeffrey C.: *See—*
Smith, Forrest P., Jr.; and Munnell, Jeffrey C., 4,680,884, Cl. 42-66.000.
Munson, James R.: *See—*
Mulflur, W. Joseph; and Munson, James R., 4,681,768, Cl. 426-417.000.
Munson, Joel V.: *See—*
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.
Murai, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Cryogenic container. 4,680,935, Cl. 62-45.000.
Murakawa, Takashi: *See—*
Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, 4,681,865, Cl. 502-74.000.
Muramatsu, Masao: *See—*
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.
Murari, Bruno: *See—*
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.
Murata Kikai Kabushiki Kaisha: *See—*
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.
Ueda, Yutaka; and Kiriake, Masaharu, 4,681,231, Cl. 209-656.000.
Murata, Syuuji: *See—*
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.
Murkens, David. Cylindrical square. 4,680,869, Cl. 33-533.000.
Murphy, John; McMullin, Francis; Egan, Michael; Byrne, John V.; and Kenneally, Patrick, to Kollmorgen Technologies Corporation. Power supply systems for inductive elements. 4,682,093, Cl. 318-701.000.
Murphy, Robert H.: *See—*
Chickanosky, John J.; Courtney, Jack W.; and Murphy, Robert H., 4,681,221, Cl. 206-328.000.

Murray, Alan: *See*—
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,681,729, Cl. 376-247.000.

Murray, Charles R.; and Harrison, Ray E., to C-I-L Inc. Shipping bag. 4,681,781, Cl. 428-35.000.

Murray, William V.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Hydroxamic acids and esters. 4,681,894, Cl. 514-507.000.

Musser, John H.; and Bender, Reinhold H. W., to American Home Products Corporation. 5-[3-[[2-quinolyl]methoxy]phenyl]-1,3-oxazoles. 4,681,940, Cl. 546-174.000.

Mussmann, Sara M.; and Kidd, Roy E., to Emhart Industries, Inc. Polar fluid detection system unaffected by power line voltages. 4,682,157, Cl. 340-605.000.

Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pivaloyloxymethyl 7-β-[2-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-(2-amino-1,3-thiadiazolyl-5-thiomethyl)-3-cepheme-4-carboxylate and pharmaceutical composition containing the same. 4,681,877, Cl. 514-206.000.

Mutschler, Edward C., Jr.: *See*—
Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, 4,682,183, Cl. 346-75.000.

MWL Tool Company: *See*—
Allwin, Roger P.; and Budke, Mark, 4,681,159, Cl. 166-124.000.

Nabeyama, Takatoshi; and Sakita, Eiichi, to Citizen Watch Co., Ltd. Apparatus for displaying astrological information. 4,681,459, Cl. 368-16.000.

Nachtigal, Joachim: *See*—
Bozung, Hanns-Gunther; and Nachtigal, Joachim, 4,680,933, Cl. 60-608.000.

Nadelson, Jeffrey, to Sandoz Pharmaceuticals Corp. N-N-disubstituted alkenamides and phenylalkenamides. 4,681,898, Cl. 514-619.000.

Nagasawa, Kohtaro; and Morikubo, Kunio, to Somar Corporation. Light-sensitive negative working composition with diazonium condensate, epoxy resin, and combination of polymers with acrylic groups. 4,681,833, Cl. 430-175.000.

Nagashima, Akira, to Kioritz Corporation. Silencing filter. 4,681,608, Cl. 55-276.000.

Nagashima, Akira: *See*—
Tasaki, Takanobu; and Nagashima, Akira, 4,681,188, Cl. 181-229.000.

Nagashima, Yoshihisa: *See*—
Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.

Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, to Omron Tateisi Electronics Co. High precision and compact contact switch. 4,681,994, Cl. 200-16.00B.

Nagayama, Susumu: *See*—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.

Nagel, Colin M.: *See*—
Heath, Robert B.; and Nagel, Colin M., 4,681,368, Cl. 297-250.000.

Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto ; and Kovacs, Attila, to Magyar Asvanyolaj es Foldgaz Kiserleti. Process and equipment for the thermic conversion of the components of gas currents contaminating the environment. 4,681,531, Cl. 431-181.000.

Naimpally, Saiprasad V., to North American Philips Consumer Electronics Corp. Video noise reduction in picture-in-picture television receiver. 4,682,234, Cl. 358-183.000.

Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, to Nippon Kogaku K. K. Zoom lens assembly. 4,681,406, Cl. 350-429.000.

Naito, Masayoshi: *See*—
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.

Najjar, Mitri S.: *See*—
Vasconcellos, Stephen R.; Najjar, Mitri S.; and Garcia, Ralph, 4,681,700, Cl. 252-373.000.

Nakagaki, Harushige; Iso, Yoshimi; and Inoue, Shigeki, to Hitachi, Ltd. Disc playback apparatus. 4,682,314, Cl. 369-44.000.

Nakagawa, Kiyohara: *See*—
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Nakagawa, Taiichi: *See*—
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, to Kyodo Printing Co., Ltd. Shock-resistant integrated circuit card. 4,682,017, Cl. 235-492.000.

Nakahashi, Masako: *See*—
Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.

Nakajima, Masao: *See*—
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.

Nakajima, Nobuyoshi: *See*—
Tanaka, Hirosi; and Nakajima, Nobuyoshi, 4,682,028, Cl. 250-327.200.

Nakajima, Yoshinori, to Ricoh Company, Ltd. Bidirectional serial printer. 4,681,470, Cl. 400-323.000.

Nakamichi, Yuji: *See*—
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.

Nakamura, Daijiro, to SM Industrial Co., Ltd. Screen roll means. 4,681,279, Cl. 242-107.300.

Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, to Toyota Jidosha Kabushiki Kaisha. Wheel slip control system. 4,681,374, Cl. 303-106.000.

Nakamura, Kazumasa: *See*—
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.

Nakamura, Kiyoaki: *See*—
Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, 4,681,313, Cl. 271-273.000.

Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, to Nippondenso Co., Ltd. Ignition distributor for internal combustion engines. 4,681,989, Cl. 200-19.00R.

Nakamura, Nobuhiro: *See*—
Kotoh, Keigo; and Nakamura, Nobuhiro, 4,682,173, Cl. 342-51.000.

Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, to Rhythm Watch Co. Ltd. Alarm signalling electronic timepiece with timer function. 4,681,465, Cl. 368-246.000.

Nakamura, Shuji, to Tokyo Aircraft Instrument Co., Ltd. Turn-and-bank indicator which displays the total angle or total time of a turn. 4,682,171, Cl. 340-975.000.

Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Fixing component. 4,681,288, Cl. 248-71.000.

Nakasuji, Norikazu: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Nakata, Yoshinari: *See*—
Hashimoto, Mikio; Nakata, Yoshinari; and Koga, Hitoshi, 4,681,816, Cl. 428-463.000.

Nakatsui, Hisashi; Imataki, Hiroyuki; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Amorphous silicon photoelectric transducer with a photoconductive colorant layer. 4,682,019, Cl. 250-211.00R.

Nakaya, Takashi, to Meinan Machinery Works, Inc. Conveyor system for conveying veneer sheets with spacings therebetween. 4,681,002, Cl. 83-71.000.

Nakaya, Yasuhiro: *See*—
Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, 4,681,118, Cl. 128-643.000.

Nakazato, Shinji: *See*—
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.

Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, to Hirose Elec. Co., Ltd.; NEC Corporation; and Japan Aviation Elec. Cord clamping mechanism. 4,681,388, Cl. 439-449.000.

Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, to Hirose Elec. Co., Ltd.; NEC Corporation; and Japan Aviation Elec. Lock pin for mounting board-mount type connector on board. 4,681,389, Cl. 439-557.000.

Nakazumi, Tadataka: *See*—
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.

Nakazyo, Kiyoshi: *See*—
Ishikawa, Takatoshi; and Nakazyo, Kiyoshi, 4,681,835, Cl. 430-386.000.

Nalco Chemical Company: *See*—
Mouche, Richard J.; and Song, Peter, 4,681,687, Cl. 210-764.000.

Naphs, Inc.: *See*—
LaRue, Philip R., 4,680,995, Cl. 81-437.000.

Naquib, Hussein M.: *See*—
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.00B.

Nash, John: *See*—
Kensey, Kenneth; and Nash, John, 4,681,106, Cl. 128-305.000.

Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., to University of Medicine and Dentistry of New Jersey. Composition for stimulating bone growth. 4,681,763, Cl. 424-95.000.

National Distillers and Chemical Corporation: *See*—
Chang, Biau-Hung, 4,681,708, Cl. 260-410.900.
Chang, Biau-Hung; and Hanes, Ronnie M., 4,681,709, Cl. 260-410.900.
Harris, Eugene G.; and Fayter, Richard G., Jr., 4,681,703, Cl. 252-522.00R.
Harris, James J.; Hostetler, Donald E.; and Achorn, G. Stanley, 4,681,924, Cl. 526-125.000.
Huynh, Anh N.; and Ziogas, Phoivos D., 4,682,266, Cl. 361-235.000.

National Nuclear Corporation Limited: *See*—
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,681,729, Cl. 376-247.000.

National Research Development Corporation: *See*—
Jenkins, Walter N.; and Davies, Gordon I., 4,681,258, Cl. 239-66.000.
Marples, Brian A.; and Stretton, Reginald J., 4,681,876, Cl. 514-182.000.

National Standard Company: *See*—
Rausch, Doyle W., 4,681,558, Cl. 474-205.000.

Natiw, Edna C. Puppet or doll having structure provided by stuffing. 4,681,555, Cl. 446-327.000.
Natsuhara, Toshiya: *See*—
Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,681,825, Cl. 430-57.000.
Navarrete, Felix M.: *See*—
Brozovic, George R.; Djobadze, Michael O.; and Navarrete, Felix M., 4,681,651, Cl. 156-382.000.
NCR Corporation: *See*—
Heys, George, Jr.; Aleshire, Rex A.; Hines, Frank; and Belknap, William M., 4,682,325, Cl. 370-85.000.
Kallin, Fredrik L. N.; and Evans, Edward R., 4,681,468, Cl. 400-120.000.
Mathes, Gene R.; and Protheroe, Robert L., 4,682,150, Cl. 340-347.0DD.
NEC Corporation: *See*—
Ichikawa, Yoshio; and Yamada, Kazumori, 4,682,148, Cl. 340-311.100.
Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.
Ishimoto, Shoji, 4,682,048, Cl. 307-269.000.
Kageyama, Takao; and Orui, Ryuzo, 4,682,076, Cl. 315-4.000.
Makino, Masayuki, 4,682,351, Cl. 379-62.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
Okano, Minoru; and Kohmoto, Mitsuo, 4,682,268, Cl. 361-384.000.
Takahashi, Tsutomu, 4,682,368, Cl. 455-38.000.
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
Nedoluha, Heinz F., to Coleman Company, Inc., The. Inhaul boom end for sailboard boom assembly. 4,681,052, Cl. 114-98.000.
Negishi, Akira: *See*—
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.
Nehring, John R., to C. R. Bard, Inc. Suction canister with disposable liner and check valve. 4,681,571, Cl. 604-320.000.
Neki, Shigeo: *See*—
Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.
Nelson, Jordan R.; and Wissing, William K., to RCA Corporation. Image display including improved light-absorbing matrix. 4,682,075, Cl. 313-466.000.
Nentwich, Heinz J.: *See*—
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.00B.
Netolicky, Charles E.: *See*—
Dvorak, Robert F.; Netolicky, Charles E.; and Palmer, Neil R., 4,681,061, Cl. 116-279.000.
Neuman, Eli, to Perfectdata Corporation. Micro floppy disc head cleaner. 4,682,257, Cl. 360-128.000.
Neuschaffer, Karlheinz: *See*—
Engels, Hans-Werner; Neuschaffer, Karlheinz; and Spielau, Paul, 4,681,631, Cl. 106-4.000.
Newman, John, to Rotaflex PLC. Electric sockets. 4,681,384, Cl. 439-137.000.
Newman, Paul, to Horizon Exploration Limited. Underwater seismic testing. 4,682,307, Cl. 367-21.000.
Newmark, Harold L.: *See*—
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.
NGK Insulators, Ltd.: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,681,074, Cl. 123-271.000.
Nguyen, Dean: *See*—
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.
Nicolas, Denise: *See*—
Durand, Jean-Pierre; Nicolas, Denise; Kohler, Norbert; Dawans, Francois; and Candau, Francoise, 4,681,912, Cl. 524-827.000.
Nicolas, Jean-Marie, to U.S. Philips Corporation. Apparatus for examining an object by ultrasonic echography. 4,680,966, Cl. 73-597.000.
Nidec-Torin Corporation: *See*—
English, George A.; and Marracino, Charles R., 4,682,065, Cl. 310-90.000.
Niederer, Kurt W. Multistage fluid filter and method. 4,681,604, Cl. 55-96.000.
Niedrach, Leonard W.; and Will, Fritz G., to General Electric Company. Portable oxygen sensor with shortened break-in time. 4,681,673, Cl. 204-415.000.
Niemann, Ludwig C., to McCully, Gerald R.; and Niemann, Ludwig C. Florist's implement. 4,681,224, Cl. 206-423.000.
Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,681,249, Cl. 228-37.000.
Nihon Sanmo Dyeing Co.: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
Niimi, Takatsune: *See*—
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
Nikaido, Masataka; and Matsuda, Sakurako, to Matsushita Electric Industrial Co., Ltd. Sound generator for electronic musical instrument. 4,681,007, Cl. 84-1.100.
Nikkai Kensetsu Kabushiki Kaisha: *See*—
Kon, Toshiharu, 4,681,998, Cl. 219-99.000.
Nillesen, Antonius H. H. J., to U.S. Philips Corporation. Digital chrominance processor with a phase and frequency controlled digital oscillator independent of the stable oscillator frequency. 4,682,209, Cl. 358-19.000.
Nippon Denso Kabushiki Kaisha: *See*—
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.
Tomisawa, Norio, 4,682,317, Cl. 369-59.000.
Nippon Hoso Kyokai: *See*—
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.
Nippon Kogaku K. K.: *See*—
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, 4,681,406, Cl. 350-429.000.
Nippon Petrochemicals Company Limited: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.
Nippon Soken, Inc.: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
Nippon Steel Corp.: *See*—
Kutsumura, Shoji; and Isonaga, Touichi, 4,681,662, Cl. 202-270.000.
Nippon Telegraph and Telephone Corp.: *See*—
Okumura, Yasuyuki; and Hayashi, Kazuhiro, 4,682,327, Cl. 370-100.000.
Nippondenso Co., Ltd.: *See*—
Ando, Noriyoshi; Mikuni, Hajime; Matsunaga, Mitsuru; Horie, Naoki; and Kishigami, Tomohisa, 4,682,228, Cl. 358-161.000.
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.
Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.
Onogi, Nobuyoshi; and Shimamoto, Mamoru, 4,681,082, Cl. 123-643.000.
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Small watercraft with asymmetrical bow portion. 4,681,058, Cl. 114-271.000.
Nishida, Takashi: *See*—
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.
Nishihara, Eitaro, to Tokyo Shibaura Denki Kabushiki Kaisha. View interpolation in a tomography system using pipe line processing. 4,682,289, Cl. 364-414.000.
Nishihashi, Junichi: *See*—
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, 4,682,003, Cl. 219-121.0LN.
Nishijima, Hideo; Ito, Takayasu; and Fukushima, Isao, to Hitachi, Ltd. Switching regulator system for a motor driving circuit. 4,682,096, Cl. 318-808.000.
Nishijima, Masaru, to Sharp Kabushiki Kaisha. Copying machine having a control process to reduce copying time. 4,681,423, Cl. 355-14.00R.
Nishikawa, Masao; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Warm-up promotion device for automatic transmission. 4,680,928, Cl. 60-329.000.
Nishikawa Sangyo Co., Ltd.: *See*—
Fujino, Yukio; and Kabaya, Morihiro, 4,680,822, Cl. 5-421.000.
Nishikawa, Toshio: *See*—
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.
Nishimura, Akira: *See*—
Ono, Kimizo; and Nishimura, Akira, 4,681,093, Cl. 128-6.000.
Nishimura, Atsushi: *See*—
Kubota, Naohiro; and Nishimura, Atsushi, 4,681,905, Cl. 524-91.000.
Nishimura, Hidetaro: *See*—
Shiozaki, Masakazu; and Nishimura, Hidetaro, 4,682,204, Cl. 357-51.000.
Nishimura, Katsuo, to Citizen Watch Co., Ltd. World time watch. 4,681,460, Cl. 368-21.000.
Nishimura, Tetsuharu: *See*—
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.
Nishimura, Yuji: *See*—
Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, 4,681,347, Cl. 280-804.000.
Nishino, Yoshimitsu: *See*—
Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,388, Cl. 439-449.000.

Nakazawa, Akira; Kikuta, Shigeru; Koike, Kihachiro; Matsuoka, Kensaku; and Nishino, Yoshimitsu, 4,681,389, Cl. 439-557.000.
Nissan Motor Co., Ltd.: *See*—
Hayasaki, Koichi; and Sugano, Kazuhiko, 4,680,992, Cl. 74-869.000.
Hayashi, Yoshimasa, 4,681,179, Cl. 180-68.400.
Honma, Masayuki, 4,681,069, Cl. 123-90.270.
Kubo, Jun, 4,682,295, Cl. 364-426.000.
Mori, Yasushi, 4,680,988, Cl. 74-866.000.
Ohashi, Toshio; and Yamamoto, Shukou, 4,682,208, Cl. 357-81.000.
Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
Nissan Shatai Company, Limited: *See*—
Uchida, Noriaki, 4,681,153, Cl. 165-31.000.
Nisshin Kohki Co., Ltd.: *See*—
Inoue, Toshiyuki, 4,682,016, Cl. 235-462.000.
Nitsuko Limited: *See*—
Iwama, Teruhiko, 4,682,014, Cl. 235-375.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,681,690, Cl. 252-8.551.
Nitto Electric Industrial Co., Ltd.: Mazda Motor Corporation: *See*—
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.
Nitto Kohki Co., Ltd.: *See*—
Mikiya, Toshio; Kaneko, Minoru; and Kazama, Yasuo, 4,681,172, Cl. 173-139.000.
Nitz, Rolf-Eberhard: *See*—
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,681,891, Cl. 514-340.000.
NL Industries, Inc.: *See*—
Kisling, James W., III, 4,681,168, Cl. 166-381.000.
Nobatake, Atsuo: *See*—
Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.
Nobel, Fred I.; and Schram, David N., to LeaRonal, Inc. Bath and process for plating tin/lead alloys. 4,681,670, Cl. 204-44.400.
Nogami, Takahiro: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for an internal combustion engine. 4,681,078, Cl. 123-490.000.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanning system. 4,681,394, Cl. 350-6.600.
Noguchi, Takaharu: *See*—
Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, 4,682,332, Cl. 371-38.000.
Nolte, Gunther, to Conrad Scholtz AG. Method and device for unloading bulk material from a large container. 4,681,503, Cl. 414-144.000.
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, to Nippon Kayaku Kabushiki Kaisha. Heat-sensitive recording sheet. 4,682,192, Cl. 503-200.000.
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha. Wheel slip control system. 4,681,373, Cl. 303-106.000.
Nomura, Yoshihisa: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
Nonaka, Yasuhiko: *See*—
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, to Toyota Jidosha Kabushiki Kaisha. Cast iron making by cerium addition. 4,681,642, Cl. 148-321.000.
Norcim Investments Pty. Ltd.: *See*—
Griffin, Arnold F.; and Hinchliffe, Warren D., 4,681,628, Cl. 75-118.00R.
Nordica S.p.A.: *See*—
Pozzobon, Alessandro; and Baggio, Giorgio, 4,680,878, Cl. 36-117.000.
Norman, Michael J.: *See*—
Ching, Neng H.; Marson, Ralph G.; Norman, Michael J.; and Hughes, John L., 4,681,436, Cl. 356-121.000.
North American Philips Consumer Electronics Corp.: *See*—
Gallaro, Anthony V., 4,681,775, Cl. 427-64.000.
Naimpally, Saiprasad V., 4,682,234, Cl. 358-183.000.
Northern Telecom Limited: *See*—
Ho, Vu Q.; Nentwich, Heinz J.; and Naquib, Hussein M., 4,680,854, Cl. 29-576.00B.
Peterson, Olav, 4,681,549, Cl. 439-181.000.
NPK "Textiling Maschinostroene": *See*—
Bahov, Dinko A.; and Bahov, Hristo A., 4,680,833, Cl. 19-244.000.
Numata, Toshio: *See*—
Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, 4,681,229, Cl. 209-534.000.
Nunokawa, Eiichi: *See*—
Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, 4,682,258, Cl. 360-132.000.
N.V. Optische Industrie "De Oude Delft": *See*—
Breemer, Johannes, 4,681,454, Cl. 356-402.000.
N.V. Sky Climber Europe S.A., naamloze vennootschap: *See*—
Rinio, Johannes, 4,681,301, Cl. 254-333.000.
O & K Orenstein & Koppel AG: *See*—
Hoffmann, Dieter; and Trumper, Reinhard, 4,681,205, Cl. 198-307.100.
O.S.E. Kabushiki Kaisha: *See*—
Kon, Toshiharu, 4,681,998, Cl. 219-99.000.
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, to Tokyo Electric Co., Ltd. Paper supply device for an electrostatic photographic printer. 4,681,422, Cl. 355-3.00R.
Obara, Haruki: *See*—
Inoue, Michiya; Obara, Haruki; and Izumiya, Shunzo, 4,681,997, Cl. 219-69.00C.
Oberhofer, David P., to Sullivan Corporation. Manufactured refining element. 4,681,270, Cl. 241-298.000.
Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen, to Hoechst Aktiengesellschaft. Process for the isolation and purification of alpha-interferons. 4,681,931, Cl. 530-351.000.
Obermeyer, Franklin D.: *See*—
Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.
Obkircher, Bernt, to Dornier System GmbH. Gassification of carbon containing waste, refuse or the like. 4,681,599, Cl. 48-92.000.
O'Brien, John V.; Holmes, Arthur S.; and Hopewell, Richard B., to Koch Process Systems, Inc. Process for the separation of landfill gas. 4,681,612, Cl. 62-23.000.
O'Brien, William D., Jr. Boat launching apparatus. 4,681,334, Cl. 280-414.100.
Obuchi, Fukashi, Ruriko Obuchi, legal representatives: *See*—
Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
Obuchi, Satoshi, deceased: *See*—
Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,680,892, Cl. 49-374.000.
Ochi, Atsushi: *See*—
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
Ochiai, Hajime; and Morihara, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Light transmission system for trains. 4,682,144, Cl. 340-48.000.
Odaka, Masanori: *See*—
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., to Research Corporation. Genetically attenuated bacterial vaccines with multiple mutations of the same phenotype. 4,681,762, Cl. 424-92.000.
Ogasawara, Takayuki: *See*—
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, 4,681,074, Cl. 123-271.000.
Ogata, Nobuyuki: *See*—
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.
Ogawa, Soichiro; and Watanabe, Yoshio, to Hitachi, Ltd. Discharge lamp operating device. 4,682,080, Cl. 315-209.00R.
Ogawa, Takao: *See*—
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.
Ogawa, Yuji: *See*—
Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, 4,681,951, Cl. 549-214.000.
Ogawa, Yutaka; Ogasawara, Takayuki; and Hanzawa, Shigeru, to NGK Insulators, Ltd. Structure of divided combustion chamber for internal combustion engine. 4,681,074, Cl. 123-271.000.
Ogusu, Chihaya: *See*—
Maruyama, Masanori; Moriya, Masamichi; Kato, Shinichi; Fukushima, Masakazu; Nonaka, Yasuhiko; and Ogusu, Chihaya, 4,682,077, Cl. 315-14.000.
O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E., to Graco Inc. Leakage preventing liquid supply pump. 4,681,516, Cl. 417-259.000.
Ohara, Kenichi: *See*—
Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.
O'Hare, Louis R. Convection powered solar heater for water tanks. 4,681,089, Cl. 126-434.000.
Ohashi, Kaoru: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.
Ohashi, Keiichi, to Skylight Industry Co. Ltd. Mount structures for suspender members of portable flashlights. 4,682,275, Cl. 362-191.000.
Ohashi, Toshio; and Yamamoto, Shukou, to Nissan Motor Co., Ltd. Transistor protection device. 4,682,208, Cl. 357-81.000.
Ohbayashi, Eiji: *See*—
Ohdai, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji, 4,680,950, Cl. 72-130.000.
Ohdai, Yozo; Abiru, Norifumi; and Ohbayashi, Eiji, to Asahi-Seiki Manufacturing Co., Ltd. Method of and an apparatus for forming tension springs with German type hooks. 4,680,950, Cl. 72-130.000.

Ohe, Takeshi: *See*—
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, 4,681,182, Cl. 180-79.100.

Ohgami, Masaaki, to Fuji Jukogyo Kabushiki Kaisha; and Van Doorne's Transmissie B. V. System for controlling the transmission ratio of an infinitely variable transmission. 4,680,990, Cl. 74-868.000.

Ohi, Toshio, to Furukawa Co., Ltd.; and Okumura Corporation. Rock drills for drilling continuously arrayed bores. 4,681,170, Cl. 173-50.000.

Ohnishi, S. Tsuyoshi. Method of preventing the growth of malaria parasites in erythrocytes. 4,681,899, Cl. 514-602.000.

Ohnishi, Tsutomu: *See*—
Kakimoto, Norihiro; Katayama, Takashi; Hazato, Tadahiko; and Ohnishi, Tsutomu, 4,681,960, Cl. 556-83.000.

Ohno, Makoto: *See*—
Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, 4,681,713, Cl. 264-41.000.

Ohta, Hironobu: *See*—
Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.

Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, to Dic-Hercules Chemicals, Inc. Rosin emulsion sizing agent. 4,681,909, Cl. 524-272.000.

Ohta, Noboru: *See*—
Mitsui, Akio; and Ohta, Noboru, 4,681,837, Cl. 430-504.000.

Ohta, Teruo, to Sony Corporation. Disk cartridge. 4,682,322, Cl. 369-291.000.

Ohtake, Masayuki: *See*—
Alaki, Yasuhide; Ohtake, Masayuki; and Ihara, Keisuke, 4,681,323, Cl. 273-232.000.

Ohtsuka, Ichiro: *See*—
Tsunewaki, Koichiro; and Ohtsuka, Ichiro, 4,680,888, Cl. 47-58.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,682,260, Cl. 360-133.000.

Oka, Tetsuo: *See*—
Katsumata, Ryoichi; Oka, Tetsuo; and Furuya, Akira, 4,681,847, Cl. 435-172.300.

Oka, Tsutomu: *See*—
Mae, Yoshiharu; and Oka, Tsutomu, 4,681,627, Cl. 75-10.190.

Okabayashi, Masanori: *See*—
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.

Okada, Shinjiro; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device and driving method therefor. 4,681,404, Cl. 350-350.00S.

Okada, Syuji: *See*—
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.

Okada, Taketoshi: *See*—
Hayashi, Shoichi; Ishihara, Hidetoshi; Okada, Taketoshi; and Kojima, Kunio, 4,680,874, Cl. 34-143.000.

Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, to Sumitomo Metal Mining Company Limited. Process for producing alloy powder containing rare earth metals. 4,681,623, Cl. 75-0.50B.

Okamoto, Hiroo; Arai, Takao; and Hoshino, Takashi, to Hitachi, Ltd. Digital data companding. 4,682,152, Cl. 340-347.0DD.

Okamoto, Hiroo; Kobayashi, Masaharu; Noguchi, Takaharu; and Arai, Takao, to Hitachi, Ltd. Method and apparatus for recording digital signals. 4,682,332, Cl. 371-38.000.

Okamoto, Kenji: *See*—
Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.

Okamoto, Kyoichi: *See*—
Morishita, Akira; Akae, Yoshifumi; Okamoto, Kyoichi; Nakagawa, Taiichi; Morikane, Hiroyuki; Kounou, Tadami; Arima, Takemi; and Hasegawa, Akinori, 4,680,979, Cl. 74-7.00E.

Okamoto, Yoshio: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,681,919, Cl. 525-292.000.

Okamura, Masahiro: *See*—
Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, 4,682,199, Cl. 357-38.000.

Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, to TDK Corporation. Magnetic tape cassette with dust-proof mechanism. 4,682,259, Cl. 360-132.000.

Okamura, Naomi: *See*—
Ikeda, Shigeru; and Okamura, Naomi, 4,681,524, Cl. 425-376.00R.

Okano, Minoru; and Kohmoto, Mitsuo, to NEC Corporation. Mounting structure for electronic circuit modules. 4,682,268, Cl. 361-384.000.

Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobutake, Atsuo, to Takase Dyeing & Printing Works, Ltd. Process for producing an electromagnetic radiation-shielding, metallized polyester fiber textile material. 4,681,591, Cl. 8-115.680.

Okazaki, Naoto: *See*—
Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, 4,681,099, Cl. 128-204.230.

Okudera, Tatsuya: *See*—
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.

Okumoto, Yutaka: *See*—
Kobayashi, Hideki; Okumoto, Yutaka; and Komori, Mikio, 4,681,505, Cl. 414-744.00R.

Okumura Corporation: *See*—
Ohi, Toshio, 4,681,170, Cl. 173-50.000.

Okumura, Yasuyuki; and Hayashi, Kazuhiro, to Nippon Telegraph and Telephone Corp. Polyphase phase lock oscillator. 4,682,327, Cl. 370-100.000.

Oldham, Susan L., to Hughes Aircraft Company. Method of fabricating composite or encapsulated articles. 4,681,718, Cl. 264-102.000.

Olin Corporation: *See*—
Kuh, Louis M.; and Lampe, Robert C., 4,681,677, Cl. 210-88.000.

Oliver, James T.: *See*—
Grozinger, Karl G.; and Oliver, James T., 4,681,884, Cl. 514-256.000.

Olofsson, Lars; and Hospers, Martin, to AB Betjanten. Vending machine. 4,681,241, Cl. 221-124.000.

Olson, George E., to A. O. Smith Harvestore Products, Inc. Drive mechanism. 4,680,980, Cl. 74-125.000.

Olson, Keith E.; and Brittain, Kent R., to Ecolab Inc. Solid cast detergents containing encapsulated halogen bleaches and methods of preparation and use. 4,681,914, Cl. 252-91.000.

Olympus Optical Co., Ltd.: *See*—
Matsubayashi, Nobuhide; and Kato, Kiichi, 4,682,311, Cl. 369-13.000.

Omniquest, Inc.: *See*—
Kornylak, Andrew T., 4,681,203, Cl. 193-35.00R.

Omron Tateisi Electronics Co.: *See*—
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

Onishi, Ken; and Sugiyama, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Decoder for decoding a two-stage encoded code. 4,682,333, Cl. 371-39.000.

Onishi, Yoko: *See*—
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Ono, Kimizo; and Nishimura, Akira, to Sumitomo Electric Industries, Ltd. Endoscope. 4,681,093, Cl. 128-6.000.

Onodera, Yasuaki: *See*—
Asai, Toshio; Nakaya, Yasuhiro; and Onodera, Yasuaki, 4,681,118, Cl. 128-643.000.

Onogi, Nobuyoshi; and Shimamoto, Mamoru, to Nippondenso Co., Ltd. Ignition system for internal combustion engine. 4,681,082, Cl. 123-643.000.

Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Transfer device for moving recumbent person. 4,680,818, Cl. 5-81.00R.

Oosugi, Keizi: *See*—
Mizuno, Tooru; Oosugi, Keizi; Esaki, Motoharu; and Ogawa, Takao, 4,682,287, Cl. 364-561.000.

Optical Materials, Inc.: *See*—
Young, Peter L., 4,681,778, Cl. 427-96.000.

ORC Manufacturing Co., Ltd.: *See*—
Yazaki, Yoshio, 4,682,277, Cl. 362-296.000.

Orimo, Taiji; Fukui, Tsugushi; and Fukumizu, Shinichi, to Kabushiki Kaisha Kobe Seiko Sho. Continuous mixer. 4,681,457, Cl. 366-84.000.

Orita, Miyahiko; Kobayashi, Yoshiki; and Mishima, Tadaaki, to Hitachi, Ltd. System and method for preparing a recognition dictionary. 4,682,365, Cl. 382-14.000.

Orr-Arienzo, Wendy A.: *See*—
Hwang, Bao-Tai; Orr-Arienzo, Wendy A.; and Glang, Reinhard, 4,681,657, Cl. 156-657.000.

Orr, Ladd J.; and Tuss, John J., to Warner & Swasey Company, The. Coordinate measuring machine with covers. 4,680,868, Cl. 33-503.000.

Ortho Diagnostic Systems Inc.: *See*—
Kramer, Peter B., 4,681,859, Cl. 436-501.000.

Ortho Pharmaceutical Corporation: *See*—
Murray, William V.; and Wachter, Michael P., 4,681,894, Cl. 514-507.000.
Porubcan, Linda S., 4,681,759, Cl. 424-80.000.

Orui, Ryuzo: *See*—
Kageyama, Takao; and Orui, Ryuzo, 4,682,076, Cl. 315-4.000.

Osaki, Shigemi: *See*—
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.

Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Electrophotosensitive member having an amorphous silicon-germanium layer. 4,681,825, Cl. 430-57.000.

Osborne, Anthony, to Kearney-National, Inc. Electric by-pass switch. 4,681,990, Cl. 200-48.0KB.

Oshita, Saiichiro, to Fuji Jukogyo Kabushiki Kaisha. Electrically operated power steering device. 4,681,183, Cl. 180-79.100.

Osswald, Hartmut: *See*—
Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.
Kleinschroth, Jurgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,885, Cl. 514-258.000.

Osumi, Hiroshi: *See*—
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

Otani, Atusi: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.
Otani, Tadahiko: *See*—
Kobayashi, Haruhiko; and Otani, Tadahiko, 4,681,077, Cl. 123-489.000.
Otis Engineering Corporation: *See*—
Dollison, William W., 4,680,930, Cl. 60-375.000.
Otoshima, Hiroo: *See*—
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.
Otten, Hans-Gunter: *See*—
Kruckenberg, Winfried; Leverenz, Klaus; and Otten, Hans-Gunter, 4,681,932, Cl. 534-575.000.
Otten, Ronald L.: *See*—
Ledermann, Donald L.; and Otten, Ronald L., 4,681,335, Cl. 280-446.00R.
Ottenstein, Sidney A.: *See*—
Kuhnel, Donald S.; and Ottenstein, Sidney A., 4,682,084, Cl. 315-307.000.
Otto Junker GmbH: *See*—
Jansen, Rudolf, 4,681,536, Cl. 432-59.000.
Oudet, Claude, to Portescap. Synchronous electric motor having a disc-shaped permanent magnet rotor. 4,682,067, Cl. 310-156.000.
Outboard Marine Corporation: *See*—
Friedle, Dennis J.; Kolb, Richard P.; and Borst, Gaylord M., 4,681,056, Cl. 114-146.000.
Overhoff, Theodor: *See*—
Mallener, Werner; and Overhoff, Theodor, 4,681,732, Cl. 376-337.000.
Owen, Robert B.; and Johnston, Mary H., to United States of America, National Aeronautics and Space Administration. Laser schlieren crystal monitor. 4,681,437, Cl. 356-129.000.
Owens-Corning Fiberglas Corporation: *See*—
Carter, Neil A.; Harris, Ronald R.; and Ault, Russell L., 4,681,722, Cl. 264-171.000.
Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, to Kawasaki Steel Corporation. Marking device for pipe. 4,682,182, Cl. 346-1.100.
Oyama, Fusami; and Takahashi, Akira, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for rear wheels of a motor vehicle. 4,681,180, Cl. 180-76.000.
Ozaki, Masaaki: *See*—
Kurihara, Norimitsu; Ozaki, Masaaki; Goto, Hiroshi; and Asakura, Masahiko, 4,681,070, Cl. 123-179.00H.
Ozaki, Masaharu: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.
Ozawa, Yasuhiko: *See*—
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.
Ozil, Maurice; and Falguieres, Alain. Universal coupling means. 4,682,285, Cl. 364-200.000.
Ozkan, Adil N., to Biostar Medical Products, Inc. Article for determining the presence of immune complexes. 4,681,782, Cl. 428-36.000.
Paccar Inc: *See*—
CCaley, Douglas A., 4,680,938, Cl. 62-93.000.
Paddock, Albert W., to United States of America, Army. Latch connector. 4,681,387, Cl. 439-347.000.
Paladino, Joseph B.: *See*—
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
Palara, Sergio; and Torazzina, Aldo, to SGS Microelettronica S.p.A. Short circuit protection device for an integrated circuit and a load connected thereto. 4,682,120, Cl. 330-298.000.
Palley, Igor: *See*—
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,681,792, Cl. 428-102.000.
Palma, Gary E.: *See*—
Sziklas, Edward A.; and Palma, Gary E., 4,682,339, Cl. 372-95.000.
Palmer, Bertram J., to BRD Company Limited. Assembly of composite shaft and yoke member of a Hookes universal joint. 4,681,556, Cl. 464-181.000.
Palmer, Kenneth L., to General Mills, Inc. Fruit products containing flaked grains. 4,681,770, Cl. 426-615.000.
Palmer, Neil R.: *See*—
Dvorak, Robert F.; Netolicky, Charles E.; and Palmer, Neil R., 4,681,061, Cl. 116-279.000.
Palmin, Simyon: *See*—
Pellegrino, John; and Palmin, Simyon, 4,682,092, Cl. 318-696.000.
Palosi, Eva: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.
Pancheri, Eugene J.: *See*—
Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., 4,681,704, Cl. 252-546.000.
Pangborn Corporation: *See*—
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,680,899, Cl. 51-427.000.
Pansiera, Timothy T. Orthopedic brace. 4,681,097, Cl. 128-77.000.
Pantalone, Antonio. Structure for metal constructions in general, in particular for trestlework constructions, accomplished by means of section bars and jointing elements. 4,680,912, Cl. 52-721.000.
Paris, Raymond L., Sr. Valve lock. 4,681,134, Cl. 137-385.000.
Park, Chung P.; and Garcia, Gerald A., to Dow Chemical Company, The. Steam expandable polymeric composition and method. 4,681,715, Cl. 264-53.000.
Park, Kyong: *See*—
Kavli, Fred; and Park, Kyong, 4,680,971, Cl. 73-718.000.
Parker Arrester Co., Ltd.: *See*—
Sato, Akira; and Maki, Fumio, 4,681,026, Cl. 98-115.200.
Parker, John A., to United Kingdom Atomic Energy Authority. Ultrasonic imaging. 4,682,296, Cl. 364-518.000.
Parker, Judson W.: *See*—
Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., 4,680,936, Cl. 62-45.000.
Parlette, Larry J.: *See*—
Peters, Richard E.; and Parlette, Larry J., 4,681,360, Cl. 296-37.600.
Parlman, Robert M.: *See*—
Bresson, Clarence R.; and Parlman, Robert M., 4,681,675, Cl. 209-167.000.
Parrott, Stephen L.: *See*—
Kukes, Simon G.; and Parrott, Stephen L., 4,681,869, Cl. 502-349.000.
Pascalide, Chiriac, to Radiant Illumination, Inc. Wireless emergency lighting unit. 4,682,078, Cl. 315-86.000.
Pascik, Imre: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.
Pasquini, Henri, to Ampafrance, S.A. Child's folding pushchair. 4,681,340, Cl. 280-642.000.
Patel, Asit G.: *See*—
Cronkhite, Paul W.; Bosley, Bruce C.; Jones, James H.; and Patel, Asit G., 4,680,893, Cl. 51-5.00R.
Paterson, Karol E.; and Everett, Nicholas P., to Stauffer Chemical Company. Sunflower induction, maintenance and regeneration media, methods of use and plants regenerated therefrom. 4,681,849, Cl. 435-240.000.
Pathe Marconi EMI SA: *See*—
Amory, Henri; and Prost, Jean-Michel, 4,681,527, Cl. 425-546.000.
Patterson, Richard L.: *See*—
Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., 4,680,841, Cl. 29-33.00M.
Paul, Winfried: *See*—
Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, 4,681,922, Cl. 525-474.000.
Paulsen, Al W. Foldable eyeglasses. 4,681,410, Cl. 351-63.000.
Paust, Joachim: *See*—
Pfaff, Klaus-Peter; Paust, Joachim; and Hartmann, Horst, 4,681,936, Cl. 536-124.000.
Pavlovec, Radko: *See*—
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Pedu, Jeffrey C., to Placid Industries, Inc. Electromagnetic clutches and brakes. 4,681,197, Cl. 192-21.500.
Peebles, Arthur K.: *See*—
Fulmer, Keith H.; Peebles, Arthur K.; and Steininger, Hugh D., 4,681,196, Cl. 192-3.00H.
Peg Perego Pines S.p.A.: *See*—
Glaser, Dieter, 4,681,331, Cl. 280-47.360.
Pegg, David T.: *See*—
Bendall, Max R.; and Pegg, David T., 4,682,107, Cl. 324-307.000.
Pellegrino, John; and Palmin, Simyon. Synchronous motor drive with chopper regulator. 4,682,092, Cl. 318-696.000.
Peltonen, Juhani: *See*—
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, 4,681,935, Cl. 536-56.000.
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, to National Nuclear Corporation Limited. Monitoring temperature within a vessel. 4,681,729, Cl. 376-247.000.
Peng, Koh K. Article of footwear. 4,680,876, Cl. 36-35.00B.
Penn, Benjamin G.: *See*—
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.
Pennison, Harold P., to Mobil Oil Corporation. Casing alignment tool. 4,681,158, Cl. 166-77.500.
Pennison, Robert A.; and Eckman, Richard E., to Dresser Industries, Inc. Retraction apparatus for automatic feed drills or the like. 4,681,490, Cl. 408-10.000.
Pennwalt Corporation: *See*—
Griffith, Ronald C., 4,681,954, Cl. 549-280.000.
Peplinski, Joseph: *See*—
Sutton, Paul M.; and Peplinski, Joseph, 4,681,685, Cl. 210-618.000.
Peppel, Michael: *See*—
Marquardt, Rainer; Salzmann, Theodor; and Peppel, Michael, 4,682,278, Cl. 363-58.000.
Perfectdata Corporation: *See*—
Neuman, Eli, 4,682,257, Cl. 360-128.000.
Perk, William E. Hollow-louvered ceilings. 4,680,910, Cl. 52-489.000.
Perkin-Elmer Corporation, The: *See*—
Ahmad, Anees; and Huse, Richard, 4,681,408, Cl. 350-609.000.
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,681,444, Cl. 356-318.000.

Hoult, Robert A.; and Ragusa, Robert P., 4,682,022, Cl. 250-214.00A.

Huber, Bernhard, 4,681,530, Cl. 431-89.000.

Perkins, Charles V., to U.S. Philips Corporation. Interferometer. 4,681,445, Cl. 356-346.000.

Perkins, John W., to Monarch Aviation, Inc. Door hydraulic arrangement. 4,680,891, Cl. 49-280.000.

Perlman, Stuart S.; Eisenhandler, Sanford; Lyons, Paul W.; and Shumila, Michael J., to RCA Corporation. Adaptive median filter system. 4,682,230, Cl. 358-167.000.

Pernet, Andre G.: *See*—
Freiberg, Leslie A.; Gracey, Howard E.; and Pernet, Andre G., 4,681,872, Cl. 514-29.000.

Peroxid-Chemie GmbH: *See*—
Doetsch, Werner; and Siegel, Rudolf, 4,681,748, Cl. 423-279.000.

Perrin, Jean. Device for connection between a traction cable and a bicycle with automatic and manual disengagement. 4,681,039, Cl. 104-193.000.

Personal Products Company: *See*—
Stern, Beth A.; and Holtman, Dennis C., 4,681,577, Cl. 604-378.000.

Personics Corporation: *See*—
Davison, Keith K., 4,682,159, Cl. 340-709.000.

Pertle, David D.: *See*—
Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., 4,681,600, Cl. 51-293.000.

Pesa, Frederick A.: *See*—
Desmond, Michael J.; Currie, Janie K.; and Pesa, Frederick A., 4,681,747, Cl. 423-277.000.

Peter, Steven E.: *See*—
O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E., 4,681,516, Cl. 417-259.000.

Peters, Richard E.; and Parlette, Larry J. Combination access box and bed liner for vehicles. 4,681,360, Cl. 296-37.600.

Petersen, Jorgen H.; and Clausen, Peter J. M., to Danfoss A/S. Vapor burner for liquid fuel. 4,681,533, Cl. 431-208.000.

Peterson, Olav, to Northern Telecom Limited. Printed circuit board edge connection arrangements. 4,681,549, Cl. 439-181.000.

Peterson, Thomas P.: *See*—
Cucci, Gerald R.; and Peterson, Thomas P., 4,681,293, Cl. 248-603.000.

Pettersson, Lars T., to Santrade Limited. Insert for chip removing machining. 4,681,487, Cl. 407-114.000.

Pews, R. Garth: *See*—
Whitten, Charles E.; and Pews, R. Garth, 4,681,943, Cl. 546-306.000.

Pfaff Industriemaschinen GmbH: *See*—
Kirch, Otto; and Willenbacher, Erich, 4,681,051, Cl. 112-306.000.
Willenbacher, Erich, 4,681,048, Cl. 112-262.300.

Pfaff, Klaus-Peter; Paust, Joachim; and Hartmann, Horst, to Basf Aktiengesellschaft. Preparation of sugar ketals. 4,681,936, Cl. 536-124.000.

Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., to Ciba-Geigy Corporation. Phenyl substituted aminodicarboxylate esters. 4,681,971, Cl. 558-414.000.

Pfiffner, Harold J., to United States of America, National Aeronautics and Space Administration. Processing circuit with asymmetry corrector and convolutional encoder for digital data. 4,682,343, Cl. 375-59.000.

Pfizer Inc.: *See*—
Reinshagen, John H., 4,681,629, Cl. 75-246.000.

Phillips Petroleum Company: *See*—
Bresson, Clarence R.; and Parlman, Robert M., 4,681,675, Cl. 209-167.000.
Feazel, Charles T., 4,681,854, Cl. 436-31.000.
Fruthaler, Katherine J.; Hopkins, Thomas R.; Hitzman, Donald O.; Kubicek, Donald H.; and Kallenbach, Lyle R., 4,681,758, Cl. 424-78.000.
Kukes, Simon G.; and Parrott, Stephen L., 4,681,869, Cl. 502-349.000.
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.
McDaniel, Max P.; and Smith, Paul D., 4,681,866, Cl. 502-154.000.
Skraba, Frank W., 4,681,743, Cl. 422-140.000.

Phipps, Cornelius M., Jr.: *See*—
Phipps, Cornelius M., Sr.; and Phipps, Cornelius M., Jr., 4,680,947, Cl. 66-117.000.

Phipps, Cornelius M., Sr.; and Phipps, Cornelius M., Jr., to Plastic Specialties, Inc. Interchangeable knitting needle system. 4,680,947, Cl. 66-117.000.

Physio-Control Corporation: *See*—
Jones, Paul W.; and Bardue, Casey M., 4,681,112, Cl. 128-419.00D.

Picker, Donald H.; and Hydes, Paul C. Combination modality cancer therapy. 4,681,091, Cl. 128-1.00R.

Pickett, Herbert M.; and Farhoomand, Jam, to United States of America, National Aeronautics and Space Administration. Method and means for generation of tunable laser sidebands in the far-infrared region. 4,682,053, Cl. 307-425.000.

Pierantozzi, Ronald: *See*—
Dyer, Paul N.; Pierantozzi, Ronald; and Withers, Howard P., 4,681,867, Cl. 502-242.000.

Pietzarka, Friedrich W.: *See*—
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, 4,681,157, Cl. 165-145.000.

Piezo Sona-Tool Corporation: *See*—
Plambeck Eric D., 4,682,070, Cl. 310-334.000.

Pillinini, Bruno. Sliding shutter door sectional wardrobe. 4,681,379, Cl. 312-297.000.

Pilot Ink Co., Ltd.: *See*—
Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, 4,681,791, Cl. 428-96.000.

Pine, James J., to Action Industries, Inc. Multidirectionally resiliently releasing ottoman for motion chair. 4,681,365, Cl. 297-85.000.

Pinto, Alwyn, to Imperial Chemical Industries PLC. Ammonia production process. 4,681,745, Cl. 423-359.000.

Pinto, Gideon; and Schanin, Jonathan, to Volta Power Belting, Ltd. Method for splicing of elastomeric belts. 4,681,646, Cl. 156-157.000.

Pissiotas, Georg: *See*—
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.

Pitasi, Martin J., to Teradyne, Inc. Heat dissipation for electronic components on a ceramic substrate. 4,682,269, Cl. 361-386.000.

Pitzer, Emory W.: *See*—
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.

PJH, Inc.: *See*—
Hill, Charles E.; Hill, Edwin L.; and Hill, Ernest W., 4,680,879, Cl. 37-67.000.

Placid Industries, Inc.: *See*—
Pedu, Jeffrey C., 4,681,197, Cl. 192-21.500.

Plambeck Eric D., to Piezo Sona-Tool Corporation. Downhole oil well vibrating system. 4,682,070, Cl. 310-334.000.

Plantsch, Josef: *See*—
Kobler, Ingo; and Plantsch, Josef, 4,681,035, Cl. 101-217.000.

Plastic Specialties, Inc.: *See*—
Phipps, Cornelius M., Sr.; and Phipps, Cornelius M., Jr., 4,680,947, Cl. 66-117.000.

Plastic Tubing Industries, Inc.: *See*—
Maroschak, Michael D.; Atchley, Frederick P.; and Everson, Douglas G., 4,681,684, Cl. 210-532.200.

Plude, Leo W.: *See*—
Church, Royce F.; McCaffrey, Donald B.; and Plude, Leo W., 4,681,286, Cl. 244-129.500.

Plummer, William T., to Polaroid Corporation. Electronic printing method. 4,681,427, Cl. 355-32.000.

Plummer, William T.: *See*—
Guerra, John M.; and Plummer, William T., 4,681,451, Cl. 356-373.000.

Poggioli, Paolo: *See*—
Swan, Jack C., Jr.; and Poggioli, Paolo, 4,681,606, Cl. 55-193.000.

Pola Chemical Industries, Inc.: *See*—
Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.

Polanecky, Vaclav, to Agrozet, koncernovy podnik. Control for a detent for a slide for automatic firearms, especially for automatic pistols. 4,681,020, Cl. 89-138.000.

Polaroid Corporation: *See*—
Foster, Donald A., 4,681,601, Cl. 55-18.000.
Guerra, John M.; and Plummer, William T., 4,681,451, Cl. 356-373.000.
Hicks, John W., Jr., 4,681,399, Cl. 350-96.300.
Kamman, Daniel T., 4,681,780, Cl. 427-282.000.
Plummer, William T., 4,681,427, Cl. 355-32.000.

Polygram International Holding B.V.: *See*—
Duurland, Jozef M.; Bos, Sinnighe J.; and Kreeft, Hendrik K., 4,681,280, Cl. 242-199.000.

Ponteggi Est S.p.A.: *See*—
Prevedini, Cesare, 4,680,906, Cl. 52-223.00L.

Ponzo, Michael F.: *See*—
Sproul, Robert W.; and Ponzo, Michael F., 4,682,128, Cl. 333-139.000.

Poore, Bernard B., to Deere & Company. Fuel injection control valve. 4,681,073, Cl. 123-206.000.

Porta Systems Corp.: *See*—
Hung, Peter; and De Luca, Paul V., 4,681,383, Cl. 439-135.000.

Porter, William F., to USG Acoustical Products Company. Slag furnace melt flow control valve. 4,681,613, Cl. 65-1.000.

Portescap: *See*—
Oudet, Claude, 4,682,067, Cl. 310-156.000.

Porubcan, Linda S., to Ortho Pharmaceutical Corporation. Rioprostil-PVP complex. 4,681,759, Cl. 424-80.000.

Potter, Curtis N., to Microelectronics and Computer Technology Corporation. Electrical interconnect support system with low dielectric constant. 4,681,655, Cl. 156-632.000.

Potter, Curtis N.; and Kroger, Harry, to Microelectronics and Computer Technology Corporation. Planarization of a layer of metal and anodic aluminum. 4,681,666, Cl. 204-15.000.

Pouring, Andrew A., to Sonex Research, Inc. Method and apparatus for disposal of toxic wastes by combustion. 4,681,072, Cl. 123-193.00P.

Pourre, Jean-Louis: *See*—
Aucouturier, Jeanne; Leboutet, Hubert; and Pourre, Jean-Louis, 4,682,114, Cl. 328-67.000.

Powers, Frederick A.: *See*—
O'Hara, John G.; Powers, Frederick A.; and Peter, Steven E., 4,681,516, Cl. 417-259.000.

Pozzobon, Alessandro; and Baggio, Giorgio, to Nordica S.p.A. Ski boot. 4,680,878, Cl. 36-117.000.

PPG Industries, Inc.: *See*—
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,681,802, Cl. 428-288.000.

Hsu, Ed C.; and Temple, Chester S., 4,681,658, Cl. 162-156.000.
Johnson, Harlan B.; Krivak, Thomas G.; and Longhini, David A., 4,681,750, Cl. 423-339.000.
Puckett, Garry D., 4,681,805, Cl. 428-391.000.
Rockar, James A., 4,680,905, Cl. 52-200.000.
Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., 4,681,811, Cl. 428-413.000.
Worley, Shelby D., 4,681,948, Cl. 548-319.000.

PRAGA-Zavody Klementa Gottwalda, narodni podnik: *See*—
Sykora, Jan; and Wangler, Jan, 4,680,989, Cl. 74-867.000.

Pratt, James O.: *See*—
McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., 4,682,299, Cl. 364-569.000.

Pratt, John D.; and Belanger, Victor, to Monogram Industries, Inc. Drive nut blend fastener with cap nut. 4,681,494, Cl. 411-54.000.

Preisner, Peter: *See*—
Hinzmann, Alfred; Preisner, Peter; and Presser, Erich, 4,681,124, Cl. 131-109.100.

Press, Irving D.; and Krieg, John, to Unidynamics Corporation. Plastic lined welded metal component and method of manufacture. 4,681,349, Cl. 285-55.000.

Presser, Erich: *See*—
Hinzmann, Alfred; Preisner, Peter; and Presser, Erich, 4,681,124, Cl. 131-109.100.

Pressure Science Incorporated: *See*—
Halling, Horace P., 4,681,353, Cl. 285-411.000.

Prestel, Fritz: *See*—
Lohner, Martin; and Prestel, Fritz, 4,682,142, Cl. 338-172.000.

Pretre, Roger. Recording box. 4,681,226, Cl. 206-449.000.

Prevedini, Cesare, to Ponteggi Est S.p.A. Coupler device for stressing cables, in prestressed concrete sliding cable structures. 4,680,906, Cl. 52-223.00L.

Prevorsek, Dusan C.: *See*—
Harpell, Gary A.; Palley, Igor; and Prevorsek, Dusan C., 4,681,792, Cl. 428-102.000.

Prima Progetti S.p.A.: *See*—
Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, 4,682,002, Cl. 219-121.0LD.

Prince Corporation: *See*—
Hemmeke, Ronald L.; and Spykerman, Scott A., 4,681,363, Cl. 296-97.00G.

Procter & Gamble Company, The: *See*—
Anderson, Arthur B.; and Brandt, Sherry L., 4,681,578, Cl. 604-385.00R.
Bernardino, Lowell W.; Kuhl, Edward W.; Mao, Mark H. K.; and Pancheri, Eugene J., 4,681,704, Cl. 252-546.000.
Brand, Larry M., 4,681,897, Cl. 514-557.000.
Divo, Michael, 4,681,695, Cl. 252-94.000.
Hardy, Frederick E.; and Ingram, Barry T., 4,681,592, Cl. 8-111.000.
Linman, E. Kelly; Curro, John J.; and Weinshenker, Eugene, 4,681,793, Cl. 428-138.000.
Reising, George S.; and Dragoo, Jerry L., 4,681,580, Cl. 604-385.00A.
Toussant, John W.; and Blaney, Ted L., 4,681,579, Cl. 604-385.00R.

Production Control Information (PCI) Limited: *See*—
Benson, Keith; and McCormack, John, 4,682,261, Cl. 364-468.000.

Progressive Machine Co., Inc.: *See*—
Honczarenko, Art, 4,681,275, Cl. 242-67.10R.

Prokop, Raymond A., to United Technologies Automotive, Inc. Fused covering for an electrical conductor and method for making the fused covering. 4,682,136, Cl. 335-282.000.

Propper Manufacturing Co., Inc.: *See*—
Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, 4,681,413, Cl. 351-205.000.

Proprietary Technology, Inc.: *See*—
Bartholomew, Donald D., 4,681,351, Cl. 285-319.000.

Prosen, Gildo G. Load support pedestal. 4,681,247, Cl. 224-322.000.

Prost, Jean-Michel: *See*—
Amory, Henri; and Prost, Jean-Michel, 4,681,527, Cl. 425-546.000.

Protheroe, Robert L.: *See*—
Mathes, Gene R.; and Protheroe, Robert L., 4,682,150, Cl. 340-347.0DD.

Psihos, George J.: *See*—
Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., 4,681,045, Cl. 110-345.000.

Puckett, Garry D., to PPG Industries, Inc. Strands of chemically treated glass fibers having a reduced tendency to give gumming deposits. 4,681,805, Cl. 428-391.000.

Pudenz-Schulte Medical Research Corp.: *See*—
Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, 4,681,560, Cl. 604-9.000.

Puetter, Hermann: *See*—
Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, 4,681,977, Cl. 560-262.000.

Purcell, John R.: *See*—
Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., 4,680,936, Cl. 62-45.000.

Purdes, Andrew J.; and Smith, Gregory C., to Texas Instruments Incorporated. Planarized dielectric deposited using plasma enhanced chemical vapor deposition. 4,681,653, Cl. 156-614.000.

Purdy, Haydn V.; and McIntosh, Ronald C. Reproduction of character images, particularly for typesetting apparatus. 4,682,189, Cl. 364-523.000.

Quan, Ronald, to Hewlett-Packard Company. Low powered high ambient light bar code reader circuit. 4,682,015, Cl. 235-472.000.

Quarroz, Daniel, to Lonza Ltd. Process for the production of 3,5-dichloro-2-pyridone. 4,681,942, Cl. 546-303.000.

R. F. Monolithics, Inc.: *See*—
Ragan, Lawrence H.; Hartmann, Clinton S.; and Ash, Darrell L., 4,682,223, Cl. 380-16.000.
Ragan, Lawrence H.; Hatmann, Clinton S.; and Ash, Darrell L., 4,682,224, Cl. 380-16.000.

Raab, Dieter: *See*—
Millauer, Wolfgang; and Raab, Dieter, 4,681,489, Cl. 408-1.00R.

Rachuk, T. W.: *See*—
Grauman, R. J.; Sponagle, G. W.; and Rachuk, T. W., 4,680,961, Cl. 73-170.00R.

Rada, Robert O.: *See*—
Harringer, Robert V.; Rada, Robert O.; and Vesely, Edward J., 4,681,208, Cl. 198-341.000.

Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, to Bayer Aktiengesellschaft. Process for the production of yellow-brown zinc ferrite pigments. 4,681,637, Cl. 106-304.000.

Radiant Illumination, Inc.: *See*—
Pascalide, Chiriac, 4,682,078, Cl. 315-86.000.

Radvanyi, Laszlo : *See*—
Kasza, Tibor; Kakonyi, Gyula; Kocso, Illes; Buzas, Attila; and Radvanyi, Laszlo , 4,682,137, Cl. 335-284.000.

Raffoni, Giuseppe. Clip fastener for corner jointing section profile elements. 4,681,498, Cl. 411-461.000.

Ragan, Lawrence H.; Hartmann, Clinton S.; and Ash, Darrell L., to R. F. Monolithics, Inc. Descrambler unit method and apparatus for television signal descrambling. 4,682,223, Cl. 380-16.000.

Ragan, Lawrence H.; Hatmann, Clinton S.; and Ash, Darrell L., to R. F. Monolithics, Inc. System, method, and apparatus for television signal scrambling and descrambling. 4,682,224, Cl. 380-16.000.

Raghupathi, Narasimhan: *See*—
Gaa, Peter C.; Hedden, Jerry C.; and Raghupathi, Narasimhan, 4,681,802, Cl. 428-288.000.

Ragle, Herbert U., to Burroughs Corporation. Photoelectric tape profile detector for file security. 4,682,039, Cl. 250-560.000.

Ragusa, Robert P.: *See*—
Hoult, Robert A.; and Ragusa, Robert P., 4,682,022, Cl. 250-214.00A.

Rairden, John R., III, to General Electric Company. Method of producing extended area high quality plasma spray deposits. 4,681,772, Cl. 427-34.000.

Rajpaul, Vinod K.: *See*—
Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., 4,681,602, Cl. 55-21.000.

Ramet, Claude: *See*—
Rojey, Alexandre; and Ramet, Claude, 4,680,939, Cl. 62-114.000.

Ramey, Philip: *See*—
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.

Ramsay, John R.; and Styrna, Zbigniew B., to Mitel Corporation. Dynamic memory refresh and parity checking circuit. 4,682,328, Cl. 371-13.000.

Rapp, Gunter: *See*—
Kirschner, Michael; Rapp, Gunter; and Zechnall, Martin, 4,682,049, Cl. 307-268.000.

Raschke, Klaus, to W. Haking Enterprises Limited. Camera shutter cocking mechanism. 4,681,416, Cl. 354-173.100.

Rasor, Julia S.; and Tickner, Ernest G., to Schering Aktiengesellschaft. Method of production and use of microbubble precursors. 4,681,119, Cl. 128-660.000.

Rast, Hans-Georg: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.

Ratchford Michael: *See*—
Bue, Richard L.; and Ratchford Michael. 4,682,292, Cl. 364-424.000.

Rathert, Horst; Grannemann, Gerhard; and Erdboris, Ulrich, to Kolbus GmbH & Co. KG. Delivery unit for bookbinding machines. 4,681,500, Cl. 412-33.000.

Rathmann, Dietrich: *See*—
Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, 4,681,922, Cl. 525-474.000.

Rauf, Richard: *See*—
Junk, Dieter; and Rauf, Richard, 4,680,843, Cl. 29-116.00R.

Rausch, Doyle W., to National Standard Company. Reinforced polymeric component and method of manufacture. 4,681,558, Cl. 474-205.000.

Ray, Claude, to ETA SA Fabriques d'Ebauches. Timepiece movement including à plurality of stepping motors and an electronic time base. 4,681,464, Cl. 368-157.000.

Raymond, A.: *See*—
Andre, Guy; Gollin, Robert; and Daloia, Gaetan, 4,680,834, Cl. 24-16.0PB.

Raytheon Company: *See*—
Clawson, Lawrence G., 4,681,085, Cl. 126-110.00R.

Razor, John E.: *See*—
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.

RCA Corporation: *See—*
Fitts, Robert W., 4,682,021, Cl. 250-213.0VT.
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.
Hinn, Werner, 4,682,233, Cl. 358-173.000.
Nelson, Jordan R.; and Wissing, William K., 4,682,075, Cl. 313-466.000.
Perlman, Stuart S.; Eisenhandler, Sanford; Lyons, Paul W.; and Shumila, Michael J., 4,682,230, Cl. 358-167.000.
Upadhyayula, Lakshminarasimha C., 4,682,055, Cl. 307-451.000.
Wargo, Robert A., 4,682,213, Cl. 358-31.000.

Re, Alberto: *See—*
Strepparola, Ezio; and Re, Alberto, 4,681,925, Cl. 526-246.000.

Reagent Chemical & Research Company: *See—*
Mulflur, W. Joseph; and Munson, James R., 4,681,768, Cl. 426-417.000.

Reber, Hans. Filtering device for separating solids from liquids. 4,681,679, Cl. 210-107.000.

Rebuffat, Carlo: *See—*
Rosati, Riccardo; and Rebuffat, Carlo, 4,681,108, Cl. 128-334.00R.

Reddi, A. H.: *See—*
Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., 4,681,763, Cl. 424-95.000.

Redus, Clifford L.: *See—*
Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., 4,681,466, Cl. 374-42.000.

Reedy, Dennis C.: *See—*
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.
Gaudenzi, Gene J.; and Reedy, Dennis C., 4,682,056, Cl. 307-456.000.

Regalbuto, John A., to Jet Research Center, Inc. Tanged charge holder. 4,681,037, Cl. 102-310.000.

Regie Nationale Des Usines Renault: *See—*
Gallet, Patrick; and Galles, Henri, 4,681,343, Cl. 280-699.000.
Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

Reichenberger, Helmut: *See—*
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.

Reillaudoux, Jean-Claude: *See—*
Geisen, Pierre; Reillaudoux, Jean-Claude; and Ducret, Bernard, 4,680,913, Cl. 52-746.000.

Reinehr, Dieter: *See—*
Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, 4,681,593, Cl. 8-128.00R.

Reiner, Alberto: *See—*
Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, 4,681,755, Cl. 424-486.000.

Reiner Brach Import-Export: *See—*
Brach, Reiner, 4,680,951, Cl. 72-160.000.

Reinshagen, John H., to Pfizer Inc. Powder metallurgical process for manufacturing copper-nickel-tin spinodal alloy articles. 4,681,629, Cl. 75-246.000.

Reising, George S.; and Dragoo, Jerry L., to Procter & Gamble Company, The. Disposable diapers with unitary waistshield and elastically expansible waistbands. 4,681,580, Cl. 604-385.00A.

Remy, Joel; and Charbonnier, Roger, to Adret Electronique. Frequency synthesizer stage adding high frequency steps to an initial frequency. 4,682,122, Cl. 331-2.000.

Renals, Martin: *See—*
Rose, Michael A.; and Renals, Martin, 4,682,030, Cl. 250-338.000.

Renfro, Cecil S.: *See—*
Stadjuhar, Robert C.; and Renfro, Cecil S., 4,680,883, Cl. 40-471.000.

Research Association For Utilization of Light Oil: *See—*
Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, 4,681,865, Cl. 502-74.000.

Research Corporation: *See—*
Azzam, Rasheed M. A., 4,681,450, Cl. 356-367.000.
Oeschger, Max P.; Hooke, Anne M.; and Bellanti, Joseph A., 4,681,762, Cl. 424-92.000.

Research Development Corp. of Japan: *See—*
Engel, Alan K., 4,681,799, Cl. 428-220.000.

Research and Education Institute, Inc. Harbor-UCLA Medical Center: *See—*
Huszczuk, Andrew R., 4,680,956, Cl. 73-1.00G.

Reuveni, Asher, to Elscint Ltd. Noise artifacts reduction. 4,682,291, Cl. 364-414.000.

Revici, Emanuel, to F.C.N.s.r.l.; and Alphatime Ltd. Pharmaceutical compositions having antineoplastic activity. 4,681,753, Cl. 424-10.000.

Rexnord Inc.: *See—*
Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.
Martin, Donald E., 4,681,215, Cl. 198-843.000.

Reznik, David. Apparatus and method for drying and curing coated substrates. 4,680,871, Cl. 34-1.000.

Rhoades, Lawrence J.; Jenkins, William D.; and Pertle, David D., to Extrude Hone Corporation. Cutting tool fabrication process. 4,681,600, Cl. 51-293.000.

Rhone-Poulenc Agrochimie: *See—*
Theissen, Robert J., 4,681,622, Cl. 71-108.000.

Rhovyl: *See—*
Chion, Pierre; and Menault, Jacques, 4,681,594, Cl. 8-489.000.
Chion, Pierre; and Menault, Jacques, 4,681,595, Cl. 8-489.000.

Rhythm Motor Parts Mfg. Co., Ltd.: *See—*
Kanegawa, Kiyoharu, 4,681,475, Cl. 403-40.000.

Rhythm Watch Co. Ltd.: *See—*
Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, 4,681,465, Cl. 368-246.000.

Rice, Mark S.; and Hunt, Paul D., to CACI, Inc. - Federal. Marine vessel and method for transporting a vehicle. 4,681,054, Cl. 114-124.000.

Rice, Paul. Diagnostic patient support apparatus. 4,681,308, Cl. 269-322.000.

Richardson, David G.: *See—*
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.

Richardson, Elvet M.; and Sim, Teik P. Waste heating recovery system. 4,680,941, Cl. 62-184.000.

Richardson, Norman; Holt, Brian; and Cook, Barry. Cotelomer compounds. 4,681,686, Cl. 210-699.000.

Richmond, Carl T.; and Lester, Joseph O., to Motorola, Inc. Moving target indicator using a surface acoustic wave device. 4,682,174, Cl. 342-160.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Richter, Karl-Heinz: *See—*
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Ricoh Company, Ltd.: *See—*
Adachi, Eiichi, 4,682,215, Cl. 358-75.000.
Adachi, Eiichi, 4,682,241, Cl. 358-261.000.
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.
Kyomasu, Mikio, 4,682,052, Cl. 307-361.000.
Nakajima, Yoshinori, 4,681,470, Cl. 400-323.000.

Ridgway, Glen E.: *See—*
Bowdy, Fredrick E.; Glasenapp, Rudi K. H.; and Ridgway, Glen E., 4,681,285, Cl. 244-103.00R.

Riess, Hartmut: *See—*
Wieland, Dieter; Aly, Abou; and Riess, Hartmut, 4,680,862, Cl. 30-381.000.

Rieter Machine Works, Ltd.: *See—*
Bischofberger, Jurg; and Lattion, Andre , 4,680,925, Cl. 57-263.000.
Briner, Emil; and Hieronymi, Richard, 4,680,924, Cl. 57-263.000.

Rilis Kagaku Kogyo Kabushiki Kaisha: *See—*
Mimasu, Takeo; and Torii, Kuniyoshi, 4,681,757, Cl. 424-47.000.

Riml, Peter, to Liebherr-Werk Telfs Ges m.b.H. Apparatus for tensioning a track chain of a tracklaying vehicle. 4,681,376, Cl. 305-10.000.

Rimma, John: *See—*
Crockatt, William B.; and Rimma, John, 4,681,910, Cl. 524-487.000.

Rinio, Johannes, to N.V. Sky Climber Europe S.A., naamloze vennootschap. Arrangement for lifting and lowering or for pulling loads. 4,681,301, Cl. 254-333.000.

Ristvedt, Mark E.: *See—*
Ristvedt, Victor G.; and Ristvedt, Mark E., 4,681,128, Cl. 453-6.000.

Ristvedt, Victor G.; and Ristvedt, Mark E. Coin sorter. 4,681,128, Cl. 453-6.000.

Ritter, Klaus; Michaelsen, Klaus; and Mair, Gunther, to BASF Aktiengesellschaft. Magnetic liquid shaft seal. 4,681,328, Cl. 277-80.000.

Roalson, Ronald L.: *See—*
Lindell, Allan D.; and Roalson, Ronald L., 4,680,885, Cl. 43-19.200.

Robb, James R., to Rockwell International Corporation. Address range comparison system using multiplexer for detection of range identifier bits stored in dedicated RAM's. 4,682,283, Cl. 364-200.000.

Robert Bosch GmbH: *See—*
Bachmann, Horst, 4,682,240, Cl. 358-224.000.
Griese, Klaus; Mayer, Siegfried; and Weigle, Dieter, 4,681,514, Cl. 417-213.000.
Kirschner, Michael; Rapp, Gunter; and Zechnall, Martin, 4,682,049, Cl. 307-268.000.
Muller, Hans-Martin, 4,681,076, Cl. 123-488.000.

Roberts, C. Kenard, to Stanley Works, The. Knife blade package and container therefor. 4,681,223, Cl. 206-354.000.

Roberts, Fred E. Adjustable table top assembly. 4,681,042, Cl. 108-6.000.

Roberts, Karl A.: *See—*
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,681,729, Cl. 376-247.000.

Roberts, Terry E.: *See—*
Manns, Michael C.; and Roberts, Terry E., 4,681,239, Cl. 220-408.000.

Robertshaw Controls Company: *See—*
Shopsky, Harvey J., 4,681,296, Cl. 251-11.000.

Robertson, Carlton E., to Carolina Power & Light Company. Decontamination of radioactively contaminated liquids. 4,681,705, Cl. 252-631.000.

Robson, Michael J.: *See—*
Williams, John; and Robson, Michael J., 4,681,969, Cl. 558-407.000.

Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, to Coatex S.A.; and Total Compagnie Fran-

caise des Petroles S.A. Composition cimentaire hydraulique a prise retardee pour cimentation a hautes temperature et pression. 4,681,634, Cl. 106-90.000.

Rochat, Alain C.: *See*—
Pfenninger, Johannes; Iqbal, Abul; and Rochat, Alain C., 4,681,971, Cl. 558-414.000.

Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having an intermediate mounting member and a separate disengaging mechanism. 4,680,830, Cl. 16-241.000.

Rockar, James A., to PPG Industries, Inc. Rafter with internal drainage feature and sloped glazing system incorporating same. 4,680,905, Cl. 52-200.000.

Rockwell International Corporation: *See*—
Dumas, Theodore A.; and Griffee, Leslie V., 4,682,181, Cl. 343-789.000.
Loper, Roger K.; and Freeman, Richard A., 4,682,123, Cl. 332-16.00R.
Robb, James R., 4,682,283, Cl. 364-200.000.
Yeh, Pochi A., 4,681,446, Cl. 356-350.000.

Rockwell-Rimoldi S.p.A.: *See*—
Marchesi, Franco, 4,681,047, Cl. 112-162.000.

Rodarte, Michael R. Aerodynamic throwing implement. 4,681,553, Cl. 446-46.000.

Rodime PLC: *See*—
Leslie, James B., 4,682,253, Cl. 360-77.000.

Rodriguez, Bernard: *See*—
Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

Roestenberg, Jerome R. Block sander vacuum. 4,680,895, Cl. 51-170.00R.

Rogers, David L.: *See*—
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.

Rogers, Leo C.; and Heitz, Alfred J. Manufacture of polycrystalline silicon. 4,681,652, Cl. 156-613.000.

Rojey, Alexandre; and Ramet, Claude, to Institut Francais du Petrole. Process for producing heat and/or cold by means of a compression engine operating with a mixed working fluid. 4,680,939, Cl. 62-114.000.

Rokuda, Morito: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.

Rolnick, Michael A., to American Medical and Emergency Research Corporation. Balloon laryngoscope. 4,681,094, Cl. 128-10.000.

Roman Products, Inc.: *See*—
Manns, Michael C.; and Roberts, Terry E., 4,681,239, Cl. 220-408.000.

Romanowski, Christopher A.: *See*—
Flowers, John E.; Romanowski, Christopher A.; and Smith, Dennis M., 4,681,152, Cl. 164-477.000.

Rooney, Thomas C.: *See*—
Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.

Roos, George E.: *See*—
Colgate, Stirling A.; and Roos, George E., 4,681,643, Cl. 149-21.000.

Rooy, Elwin L.: *See*—
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.

Rosalki, Sidney B., to Boehringer Mannheim GmbH. Process and reagent for the differentiated determination of isoenzymes of alkaline phosphatase. 4,681,842, Cl. 435-21.000.

Rosati, Riccardo; and Rebuffat, Carlo. Circular mechanical anastomotic gun. 4,681,108, Cl. 128-334.00R.

Rose, Michael A.; and Renals, Martin, to U.S. Philips Corporation. Infrared radiation detector with integral fresnel lens window. 4,682,030, Cl. 250-338.000.

Rosemount Inc.: *See*—
Cucci, Gerald R.; and Peterson, Thomas P., 4,681,293, Cl. 248-603.000.

Rosen, Perry: *See*—
Holland, George W.; Maag, Hans; and Rosen, Perry, 4,681,962, Cl. 556-441.000.

Rosenblatt, Aaron A.: *See*—
Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., 4,681,739, Cl. 422-37.000.

Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., to Scopas Technology Co., Ltd., The. Use of chlorine dioxide gas as a chemosterilizing agent. 4,681,739, Cl. 422-37.000.

Rosenbusch, Helmut: *See*—
Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, 4,681,413, Cl. 351-205.000.

Rost, Manfred, to Krautkramer-Branson, Incorporated. Ultrasonic angle test probe having at least two transducers. 4,680,967, Cl. 73-628.000.

Rotaflex PLC: *See*—
Newman, John, 4,681,384, Cl. 439-137.000.

Roth, Bruce D., to Warner-Lambert Company. Trans-6-[2-(3- or 4-carboxamido-substituted pyrrol-1-yl)alkyl]-4-hydroxypyran-2-one inhibitors of cholesterol synthesis. 4,681,893, Cl. 514-422.000.

Roth, Howard. Pegboard mounted tool holder. 4,681,233, Cl. 211-70.600.

Rothkegel, Bernhard: *See*—
Schreiner, Horst; and Rothkegel, Bernhard, 4,681,702, Cl. 252-518.000.

Rouge, Anthony; and Schulze, Joachim, to Rouge, Anthony. Wind propelled land vehicle. 4,681,333, Cl. 280-87.04A.

Rousset, Jacky: *See*—
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Royston Laboratories, Inc.: *See*—
Settineri, Robert A., 4,681,986, Cl. 174-84.00R.

Rubinstein, Leon. Plastic swivel connector and mold therefor. 4,680,837, Cl. 24-237.000.

Ruble, Paul E. Self-loading binder. 4,681,472, Cl. 402-3.000.

Ruelle, Jean-Jacques; d'Andrea, Giacomo; and Asselberghs, Leopold, to Solvay & Cie. Apparatus for fast determination of the rheological properties of thermoplastics. 4,680,958, Cl. 73-56.000.

Rummel, Raymond W.; and Crystal, Anthony A., to White Consolidated Industries, Inc. Dryer mounting bracket assembly. 4,680,948, Cl. 68-3.00R.

Rupp, James W., to Allied Corporation. Method of manufacturing a rotor. 4,680,844, Cl. 29-156.40R.

Rupprechter, Helmut: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,680,830, Cl. 16-241.000.

Rutkiewic, Andrew F.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Coating composition of polyester oligomer and acrylic binder. 4,681,815, Cl. 428-458.000.

Rychiger, Peter: *See*—
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,680,917, Cl. 53-440.000.

S.W.R. (Australia) Pty. Ltd.: *See*—
Camilleri, Paul, 4,681,483, Cl. 405-267.000.

Safe-N-Sound Pty. Limited: *See*—
Heath, Robert B.; and Nagel, Colin M., 4,681,368, Cl. 297-250.000.

Safeway Products, Inc.: *See*—
Drapeau, Donald F.; Moore, Benjamin N.; and Hall, Henry B., 4,682,010, Cl. 219-381.000.

Sagami Chemical Research Center: *See*—
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.
Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, 4,681,951, Cl. 549-214.000.

Saint, David H.; and Funk, John W., to Canada, Her Majesty the Queen in right of. Blast wave densitometer system. 4,682,034, Cl. 250-363.00R.

Saint-Gobain Vitrage: *See*—
Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, 4,681,794, Cl. 428-188.000.

Saito, Akira, to Kyocera Corporation. Silicon carbide sintered body and process for production thereof. 4,681,861, Cl. 501-89.000.

Saito, Masayuki; and Hamada, Mitsuo, to Toray Silicone Co., Ltd. Bonding primer composition. 4,681,636, Cl. 106-287.150.

Saito, Tetsuo: *See*—
Takaoka, Takashi; Koyahara, Satoru; and Saito, Tetsuo, 4,682,321, Cl. 369-284.000.

Saito, Toshinori; and Takeuchi, Makoto, to Jeol Ltd. Two-stage pump assembly. 4,681,513, Cl. 417-2.000.

Saito, Tsutomu: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Multi-layered semi-conductor photodetector. 4,682,196, Cl. 357-30.000.

Sakai, Shinji; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing device. 4,681,419, Cl. 354-402.000.

Sakakibara, Masahiko: *See*—
Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, 4,681,813, Cl. 428-450.000.

Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, to Dai Nippon Toryo Co., Ltd.; and Tokai Kogyo Co., Ltd. Molding process for plastics. 4,681,712, Cl. 264-24.000.

Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Rotor for rotary fluid pump. 4,681,519, Cl. 418-152.000.

Sakamoto, Katsuyoshi, to Amada Company, Limited. Die exchange device. 4,680,955, Cl. 72-462.000.

Sakata, Yoshiya: *See*—
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.

Sakita, Eiichi: *See*—
Nabeyama, Takatoshi; and Sakita, Eiichi, 4,681,459, Cl. 368-16.000.

Sakurada, Kazuyuki: *See*—
Oyama, Akihiro; Funyu, Yutaka; and Sakurada, Kazuyuki, 4,682,182, Cl. 346-1.100.

Sakurada, Nobuaki: *See*—
Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, 4,682,186, Cl. 346-140.00R.
Sasaki, Takashi; Sakurada, Nobuaki; Kawamura, Hideaki; and Moriyama, Jiro, 4,682,216, Cl. 358-79.000.

Sakurada, Shuroku; and Ikeda, Yasuhiko, to Hitachi, Ltd. Gate turn-off thyristor with integral capacitive anode. 4,682,198, Cl. 357-38.000.

Sakurai, Akio; and Kato, Ryoichi, to Central Research Institute of Electric Power Industry; and Hitachi, Ltd. Fast breeder reactor. 4,681,726, Cl. 376-171.000.

Sakurai, Takayasu; and Iizuka, Tetsuya, to Kabushiki Kaisha Toshiba. Self-refresh control circuit for dynamic semiconductor memory device. 4,682,306, Cl. 365-222.000.

Sakurai, Terushige: *See*—
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.

Sakuramoto, Takahumi: *See*—
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.

Salminen, Ari: *See*—
Cedercreutz, Axel; and Salminen, Ari, 4,681,287, Cl. 245-6.000.

Salomon, Ingeborg: *See*—
Obermeier, Rainer; Salomon, Ingeborg; and Ludwig, Jurgen, 4,681,931, Cl. 530-351.000.

Salzmann, Theodor: *See*—
Marquardt, Rainer; Salzmann, Theodor; and Peppel, Michael, 4,682,278, Cl. 363-58.000.

Sampath, T. K.: *See*—
Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., 4,681,763, Cl. 424-95.000.

Sanada, Yukitomo: *See*—
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Sanchez, Ruben G. Re-closure device for pop top containers. 4,681,238, Cl. 220-260.000.

Sanders Associates, Inc.: *See*—
Kuppenheimer, John D., Jr., 4,682,338, Cl. 372-72.000.

Sanders, Robert E.; Flynn, Charles J.; and Vertreese, John L., to Hallmark Cards, Inc. Light string ornament circuitry. 4,682,079, Cl. 315-186.000.

Sandman, Daniel J.; and Elman, Boris S., to GTE Laboratories Incorporated. Chemical modification of polydiacetylene crystals. 4,681,920, Cl. 525-328.100.

Sandoz Ltd.: *See*—
Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.
Siegl, Helene, 4,681,754, Cl. 424-10.000.

Sandoz Pharmaceuticals Corp.: *See*—
Nadelson, Jeffrey, 4,681,898, Cl. 514-619.000.

Sanford, Robert A.: *See*—
Strubel, David G.; and Sanford, Robert A., 4,681,126, Cl. 131-370.000.

Sangamo Weston, Inc.: *See*—
Swanson, Scott C., 4,682,169, Cl. 379-104.000.

Sanglier, Jean-Jacques: *See*—
Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.

Sano, Shin-ichi: *See*—
Ebara, Ryohei; and Sano, Shin-ichi, 4,681,784, Cl. 428-40.000.

Sano, Tetsuo: *See*—
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.

Santel, Hans-Joachim: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.

Santin, Ernest M.: *See*—
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.

Santrade Limited: *See*—
Markusson, Lars O., 4,681,488, Cl. 407-114.000.
Pettersson, Lars T., 4,681,487, Cl. 407-114.000.

Sanyo Electric Co., Ltd.: *See*—
Doutsbo, Nobuhide, 4,682,247, Cl. 360-10.200.
Fukatsu, Takeo; Goto, Kazuyuki; Haku, Hisao; and Kuwano, Yukinori, 4,681,826, Cl. 430-65.000.

Sardella, Louis M., to Wm. C. Staley Machinery Corporation. Intermittently protruding feeder for paperboard blanks. 4,681,311, Cl. 271-11.000.

Sartorio, Franco: *See*—
Delle Piane, Alberto; Sartorio, Franco; Cantello, Maichi; and Ghiringhello, Guglielmo, 4,682,002, Cl. 219-121.0LD.

Sarwinski, Raymond E.; Purcell, John R.; Parker, Judson W.; and Burnett, Sibley C., to GA Technologies Inc. Cryogenic magnet systems. 4,680,936, Cl. 62-45.000.

Sasakawa, Atsushi: *See*—
Yamauchi, Takashi; Hayashi, Shoichiro; and Sasakawa, Atsushi, 4,681,978, Cl. 562-413.000.

Sasaki Glass Co., Ltd.: *See*—
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, 4,682,003, Cl. 219-121.0LN.

Sasaki, Hiroyuki: *See*—
Morikawa, Shigenori; Hanzawa, Kohtaro; Sasaki, Hiroyuki; and Morokuma, Hiroshi, 4,681,008, Cl. 84-1.280.

Sasaki, Takashi; Sakurada, Nobuaki; and Kawamura, Hideaki, to Canon Kabushiki Kaisha. Method for forming a color image. 4,682,186, Cl. 346-140.00R.

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Sato, Akira; and Maki, Fumio, to Parker Arrester Co., Ltd. Spray coating chamber free from painting mist leakage. 4,681,026, Cl. 98-115.200.

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Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, to Toyota Jidosha Kabushiki Kaisha; and Nippon Denso Kabushiki Kaisha. Electromagnetic directional control valve. 4,681,143, Cl. 137-625.370.

Sato, Hiroyuki: *See*—
Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.

Sato, Jun, to Shimano Industrial Company Limited. Fishing reel. 4,681,276, Cl. 242-84.10R.

Sato, Kiyoshi; and Matsui, Nobuo, to Fuji Photo Optical Co., Ltd. Test pattern projector for a color television camera. 4,682,214, Cl. 358-55.000.

Sato, Teiji: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.

Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, to Tottori University. Breath-synchronized concentrated-oxygen supplier. 4,681,099, Cl. 128-204.230.

Sato, Tsunehiko: *See*—
Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.

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Sato, Yuichi: *See*—
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Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, to TDK Corporation. Video cassette cartridge construction. 4,682,258, Cl. 360-132.000.

Satoh, Toshihiko: *See*—
Fujino, Masahisa; Fukahori, Hidehiko; and Satoh, Toshihiko, 4,681,417, Cl. 354-234.100.

Satoh, Toshio; and Tsukamoto, Goro, to Kanebo, Ltd. Novel guanidinomethylcyclohexanecarboxylic acid compounds and anti-ulcer drug containing the same. 4,681,895, Cl. 514-535.000.

Satzinger, Gerhard: *See*—
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.

Saunders, John: *See*—
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,681,966, Cl. 558-255.000.

Sayano, Reizo; and Goldberg, Eugene P., to Intermedics Intraocular, Inc. Intraocular implant. 4,681,585, Cl. 623-6.000.

Sbaschnigg, Johann, to Maschinenfabrik Andritz Actiengesellschaft. Multi-nip high pressure press. 4,681,659, Cl. 162-360.100.

Schaefer, Werner: *See*—
Fabinski, Walter; and Schaefer, Werner, 4,682,031, Cl. 250-345.000.

Schallner, Otto: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.

Schanin, Jonathan: *See*—
Pinto, Gideon; and Schanin, Jonathan, 4,681,646, Cl. 156-157.000.

Schapel, Dietmar: *See*—
Baumgarten, Jorg; Frommer, Werner; Mann, Theo; Pascik, Imre; Rast, Hans-Georg; and Schapel, Dietmar, 4,681,851, Cl. 435-262.000.

Scharf, Helmut; and Krix, Wilfried, to Huls Aktiengesellschaft. Method of utilizing distillation residues of phthalic acid anhydride or maleic acid anhydride. 4,681,046, Cl. 110-346.000.

Scharfenbergkupplung GmbH: *See*—
Forster, Hilmar; and Lindner, Harald, 4,681,235, Cl. 213-50.000.

Schatz, Oskar. Apparatus for supercharging an internal combustion engine. 4,680,932, Cl. 60-605.000.

Scheinert, Wolfgang: *See*—
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.

Schenke, Reynold A.: *See*—
Schenke, Robert W.; and Schenke, Reynold A., 4,681,534, Cl. 431-290.000.

Schenke, Robert W.; and Schenke, Reynold A. Candle holder with drain holes. 4,681,534, Cl. 431-290.000.

Schering Aktiengesellschaft: *See*—
Laurent, Henry; Bittler, Dieter; Beier, Sybille; and Elger, Walter, 4,681,875, Cl. 514-182.000.
Rasor, Julia S.; and Tickner, Ernest G., 4,681,119, Cl. 128-660.000.

Schettler, Helmut: *See*—
Beranger, Herve L.; Gaudenzi, Gene J.; Reedy, Dennis C.; and Schettler, Helmut, 4,682,050, Cl. 307-270.000.

Scheven, Gunter: *See*—
Baumgart, Rudolf; Martin, Manfred; Low, Lothar; and Scheven, Gunter, 4,681,720, Cl. 264-150.000.

Schiek, Robert C., to Ciba-Geigy Corporation. Iron blue pigments and process for preparation. 4,681,638, Cl. 106-309.000.

Schiller, Werner: *See*—
Burghoff, Karl; Schiller, Werner; Albrecht, Wilhelm; Harsch, Herbert; and Burghoff, Heinz-Georg, 4,680,952, Cl. 72-161.000.

Schinazi, Raymond F.: *See*—
Chu, Chung K.; and Schinazi, Raymond F., 4,681,933, Cl. 536-23.000.

Schliessmann, Kurt: *See*—
Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt, 4,681,034, Cl. 101-211.000.
Schlumberger Messgerate GmbH: *See*—
Schutz, Johann, 4,682,124, Cl. 332-19.000.
Schmall, Karl-Heinz, to GET Gesellschaft fur Elektronik-Technologie mbH. Measuring arrangement having a capacitive measuring electrode and a working tool with integrated electrode. 4,682,004, Cl. 219-121.0PC.
Schmed, Arthur; and Frei, Hans-Peter, to Gesamat AG. Apparatus for the preparation of hot beverages, particularly a coffee machine. 4,681,028, Cl. 99-289.00R.
Schmid, Werner: *See*—
Farooq, Saleem; Reinehr, Dieter; and Schmid, Werner, 4,681,593, Cl. 8-128.00R.
Schmidt, Karl-Heinz; and Seibt, Artur, to Voest-Alpine Automotive m.b.H. Resolver circuit. 4,682,090, Cl. 318-661.000.
Schmidt, Manfred; Paul, Winfried; Freitag, Dieter; and Rathmann, Dietrich, to Bayer Aktiengesellschaft. Thermoplastic polysiloxane-polyester (carbonate) block copolymers, their preparation and use. 4,681,922, Cl. 525-474.000.
Schmidt, Otto H.; Heine, Helmut A.; and Rosenbusch, Helmut, to Propper Manufacturing Co., Inc.; and Heine Optotecnik GmbH & Co. KG. Headband with optical device adjustably coupled thereto. 4,681,413, Cl. 351-205.000.
Schmidt, Robert R.: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.
Schmits, Heinz-Herbert: *See*—
Heinemann, Otto; and Schmits, Heinz-Herbert, 4,681,021, Cl. 91-178.000.
Schneider, Franz; Braitinger, Helmut; and Feinauer, Otto, to L. Schuler GmbH. Simulation arrangement for determining desired values for the transport of workpieces of a multistage press. 4,682,280, Cl. 364-191.000.
Schneider, Robert: *See*—
Miller, Ralph; Bollini, Jakob L.; and Schneider, Robert, 4,681,710, Cl. 260-508.000.
Schneider, Siegfried: *See*—
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.
Schneider, Thomas E.; Kolanowski, Clarence; and Patterson, Richard L., to Molex Incorporated. Electrical harness fabrication apparatus. 4,680,841, Cl. 29-33.00M.
Schock, Gernot: *See*—
Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, 4,681,735, Cl. 420-464.000.
Schoffl, Rainer: *See*—
Fischer, Nikolaus H. J.; Mathey, Christoph; and Schoffl, Rainer, 4,681,017, Cl. 89-29.000.
Scholz, Heinz: *See*—
Clasen, Rolf; and Scholz, Heinz, 4,681,614, Cl. 65-18.100.
Schonafinger, Karl; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. Dihydro-2,6-dimethyl pyridines, formulations and method of use for treating angina pectoris, high blood pressure or disturbances of cerebral or peripheral blood flow. 4,681,891, Cl. 514-340.000.
Schrader, Elliott G., to Texas Instruments Incorporated. Ripple and droop reduction circuit. 4,682,369, Cl. 455-127.000.
Schram, David N.: *See*—
Nobel, Fred I.; and Schram, David N., 4,681,670, Cl. 204-44.400.
Schreiner, Horst; and Rothkegel, Bernhard, to Siemens Aktiengesellschaft. Sintered, electrical contact material for low voltage power switching. 4,681,702, Cl. 252-518.000.
Schriver, Harold S., Jr., to AMP Incorporated. Moldable composition. 4,681,691, Cl. 252-12.000.
Schrock, Richard R., to Massachusetts Institute of Technology. Catalyst composition for effecting metathesis of olefins. 4,681,956, Cl. 556-12.000.
Schrofer, Eldred P., to American Telephone & Telegraph Co., AT&T Bell Lab. Queue administration method and apparatus. 4,682,284, Cl. 364-200.000.
Schuetz, James A., to Honeywell Inc. Reactively sputtered chrome silicon nitride resistors. 4,681,812, Cl. 428-432.000.
Schukoff, Bruno, to A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik mbh Prof. Dr.Dr. h.c. Hans List. Device for the temporary interruption of the pressure build-up in a fuel injection pump. 4,681,080, Cl. 123-506.000.
Schulte, Rudolf R.; East, Gary P.; and Heindl, Alfons, to Pudenz-Schulte Medical Research Corp. Subcutaneous infusion reservoir and pump system. 4,681,560, Cl. 604-9.000.
Schulz, Rene ; Teubler, Heinz; and Breuer, Peter, to Vickers Systems GmbH. Hydraulic pump. 4,681,517, Cl. 417-300.000.
Schulze, Harry O.; and Karam, Ronald E., to GTE Products Corp. Gray body colored zinc sulfide activated with copper. 4,681,807, Cl. 428-403.000.
Schulze, Joachim: *See*—
Rouge, Anthony; and Schulze, Joachim, 4,681,333, Cl. 280-87.04A.
Schulzen, Herbert; Kohler, Wolfgang; and Schliessmann, Kurt. Process for printing a substrate by the hot-transfer printing method. 4,681,034, Cl. 101-211.000.
Schumann, Erwin: *See*—
Hoffmann, Gerhard; Bauer, Rudolf; Heilmann, Paul; and Schumann, Erwin, 4,682,011, Cl. 219-390.000.
Schunter, Roland, to Floordress Reinigungsgeraete. Floor wiper frame. 4,680,826, Cl. 15-147.00R.
Schurter, Rolf: *See*—
Bohner, Beat; Fory, Werner; Schurter, Rolf; and Pissiotas, Georg, 4,681,620, Cl. 71-93.000.
Schuss, Werner: *See*—
Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, 4,681,540, Cl. 433-126.000.
Schuster, Lorenz M. Glass and bottle tote. 4,681,225, Cl. 206-426.000.
Schutz, Johann, to Schlumberger Messgerate GmbH. Circuit including a DC-FM phase locked loop. 4,682,124, Cl. 332-19.000.
Schwartz, David M., to CompuSonics Video Corporation. Audio and video digital recording and playback system. 4,682,248, Cl. 360-32.000.
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, to Uhde GmbH. Crossflow heat exchanger. 4,681,157, Cl. 165-145.000.
Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Two-cylinder viscous liquid pump with pipe switch. 4,681,022, Cl. 91-471.000.
Scopas Technology Co., Ltd., The: *See*—
Rosenblatt, David H.; Rosenblatt, Aaron A.; and Knapp, Joseph A., 4,681,739, Cl. 422-37.000.
Scott & Fetzer Company, The: *See*—
MacAskill, Robert B.; and Braun, Jeffrey J., 4,682,082, Cl. 315-219.000.
Seagate Technology: *See*—
Smith, Robert F., 4,682,252, Cl. 360-67.000.
Seeger, Stefan: *See*—
Brunner, Heinz; and Seeger, Stefan, 4,681,272, Cl. 242-47.010.
Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, to U.S. Philips Corporation. Voltage-current converter. 4,682,098, Cl. 323-315.000.
Seibt, Artur: *See*—
Schmidt, Karl-Heinz; and Seibt, Artur, 4,682,090, Cl. 318-661.000.
Seiffarth, Ernst A.: *See*—
Halldorsson, Thorsteinn; and Seiffarth, Ernst A., 4,682,024, Cl. 250-225.000.
Seiger, Harvey N., to Gould Inc. Bipolar electrode formation. 4,681,663, Cl. 204-21.000.
Seiko Epson Kabushiki Kaisha: *See*—
Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.
Sekimoto, Yukihiko: *See*—
Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,681,690, Cl. 252-8.551.
Selbach, Bernd; and Vary, Peter, to U.S. Philips Corporation. Method of recognizing speech pauses. 4,682,361, Cl. 381-46.000.
Selby, Garry J.: *See*—
Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., 4,681,424, Cl. 355-14.00R.
Sell, William F., to Ellenberger & Poensgen GmbH. Push-button actuated overload protective circuit breaker. 4,682,138, Cl. 337-68.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,680,855, Cl. 29-583.000.
Sequeira, Richard J.; and Valadez, Frank R. Gas flow pulsation dampener and pressure differential control. 4,681,136, Cl. 137-494.000.
Serbin, David J.: *See*—
Cole, William M.; Fenske, Steven L.; Serbin, David J.; Malani, Shrikant R.; Clark, Frank J.; and Beattie, Joanne L., 4,681,929, Cl. 528-493.000.
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, to Hitachi, Ltd. Image correction processing method and apparatus. 4,682,300, Cl. 364-571.000.
Seton Products Limited: *See*—
Coplans, Carl W., 4,681,113, Cl. 450-134.000.
Settineri, Robert A., to Royston Laboratories, Inc. Splice construction for electrical cable and method for making the same. 4,681,986, Cl. 174-84.00R.
Settler, Bert. Antimony electrode assembly and method of manufacture, and use thereof. 4,681,116, Cl. 128-635.000.
Sevey, Douglas, to Waterloo Industries, Inc. Removable drawer slide and interlock with drawer. 4,681,381, Cl. 312-333.000.
Sewing, Karlernst: *See*—
Freudenreich, Erwin; Flerlage, Horst; and Sewing, Karlernst, 4,682,274, Cl. 362-61.000.
SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG: *See*—
Wahling, Werner; and Ziegler, Gunther, 4,680,984, Cl. 74-574.000.
SGS Microelettronica S.p.A.: *See*—
Palara, Sergio; and Torazzina, Aldo, 4,682,120, Cl. 330-298.000.
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.
Shanksville Corporation N.V.: *See*—
Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,681,844, Cl. 435-68.000.
Sharbaugh, John E., to United States of America, Energy. Nuclear reactor construction with bottom supported reactor vessel. 4,681,731, Cl. 376-285.000.
Sharp Kabushiki Kaisha: *See*—
Miyake, Kazunari, 4,682,313, Cl. 369-39.000.
Nishijima, Masaru, 4,681,423, Cl. 355-14.00R.
Sheasby, Peter G.: *See*—
Davies, Nigel C.; and Sheasby, Peter G., 4,681,668, Cl. 204-28.000.
Sheem, Sang K. Game toy. 4,681,325, Cl. 273-345.000.
Shell Oil Company: *See*—
Hwo, Charles C., 4,681,804, Cl. 428-349.000.
Sie, Swan T., 4,681,701, Cl. 252-373.000.

Shelton, Jean C.: *See*—
Livingston, Peter M.; and Shelton, Jean C., 4,682,025, Cl. 250-201.000.

Sherwin-Williams Company, The: *See*—
Sprute, Fritz A., 4,681,262, Cl. 239-306.000.

Sheth, Prabhakar R.: *See*—
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.

Shiba, Haruo: *See*—
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.
Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, 4,682,258, Cl. 360-132.000.

Shibahashi, Yutaka; Nakasuji, Norikazu; Kataoka, Takashi; Inagaki, Hiroshi; Kito, Tutomu; Ozaki, Masaharu; Matunami, Nobuaki; Ishimura, Naoya; and Fujita, Katuyuki, to Pilot Ink Co., Ltd. Thermochromic textile material. 4,681,791, Cl. 428-96.000.

Shibanai, Ichiro; Horikoshi, Koki; and Kato, Takashi. Crosslinking agent and process for the preparation of the same. 4,681,934, Cl. 536-46.000.

Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, to Sagami Chemical Research Center. Bicyclo(3.3.0)octene derivatives. 4,681,951, Cl. 549-214.000.

Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, to Sony Corporation. Video and audio signal recording, reproducing and editing apparatus with replacement of viewed luminance signal component during insert audio editing mode. 4,682,245, Cl. 358-311.000.

Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, to Matsushita Electric Industrial Co. Ltd. Circuit arrangement for controlling starting current of a motor. 4,682,095, Cl. 318-778.000.

Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, to Fuji Photo Film Co., Ltd. Coating apparatus. 4,681,062, Cl. 118-410.000.

Shibusawa, Mitsuo: *See*—
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Shiley Inc.: *See*—
Edelman, William, 4,681,104, Cl. 128-303.100.

Shimamoto, Mamoru: *See*—
Onogi, Nobuyoshi; and Shimamoto, Mamoru, 4,681,082, Cl. 123-643.000.

Shimano Industrial Company Limited: *See*—
Sato, Jun, 4,681,276, Cl. 242-84.10R.

Shimatani, Ryoichi: *See*—
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.

Shimizu, Hajime. Display for radars or sonars. 4,682,177, Cl. 342-176.000.

Shimizu, Shoji, to Excell Corporation. Apparatus for molding plastic products. 4,681,525, Cl. 425-527.000.

Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electric power steering system for vehicles. 4,681,181, Cl. 180-79.100.

Shimizu, Yukio: *See*—
Konishi, Toshiharu; Shimizu, Yukio; Sakuramoto, Takahumi; Morishita, Tsuyoshi; and Osaki, Shigemi, 4,681,733, Cl. 419-8.000.

Shimomura, Yasuo: *See*—
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.

Shimotori, Kazumi: *See*—
Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.

Shinada, Manabu, to Kabushiki Kaisha Riken. Piston ring. 4,681,817, Cl. 428-549.000.

Shinada, Masayuki: *See*—
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Shinagawa Shoko Co., Ltd.: *See*—
Nakamura, Toshinobu, 4,681,288, Cl. 248-71.000.

Shiokama, Yoshiharu: *See*—
Naito, Hideshi; Kodaka, Yoshiro; and Shiokama, Yoshiharu, 4,681,406, Cl. 350-429.000.

Shiono, Hiroshi: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.

Shiono, Manzo: *See*—
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.

Shiono, Shigeo: *See*—
Minakawa, Takao; Shiono, Shigeo; and Nishihashi, Junichi, 4,682,003, Cl. 219-121.0LN.

Shionogi & Co., Ltd.: *See*—
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.

Shiozaki, Masakazu; and Nishimura, Hidetaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Fuse element for integrated circuit memory device. 4,682,204, Cl. 357-51.000.

Shirai, Akira: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.

Shirley, John R., to Central Security Mfg. Corp. Personnel security system. 4,682,155, Cl. 340-573.000.

Shirotori, Hidefumi: *See*—
Kojima, Sadao; Abe, Hitoshi; Ishizaki, Fumio; Otani, Atusi; and Shirotori, Hidefumi, 4,680,999, Cl. 82-36.00B.

Shishido, Tadao: *See*—
Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, 4,681,838, Cl. 430-367.000.

Shoemaker, Jack W. Pipe laying method and apparatus. 4,681,439, Cl. 356-154.000.

Shopsky, Harvey J., to Robertshaw Controls Company. Valve construction and method of making the same. 4,681,296, Cl. 251-11.000.

Short, Keith E., to Sundstrand Corporation. Boiler for a torpedo and system including the same. 4,680,934, Cl. 60-652.000.

Shu, Brandon, to High Brandon Incorporated. Portable cooking, toasting, roasting, and carbonado heating device. 4,681,083, Cl. 126-9.00R.

Shulman, Seth D., to Bioscan, Inc. Solid state counting system for high energy beta and gamma decay isotopes. 4,682,035, Cl. 250-370.000.

Shumila, Michael J.: *See*—
Perlman, Stuart S.; Eisenhandler, Sanford; Lyons, Paul W.; and Shumila, Michael J., 4,682,230, Cl. 358-167.000.

Sick, Erwin, to Erwin Sick GmbH Optik-Elektronik. Optoelectronic comparison apparatus for structures on plane surfaces or for planar structures. 4,681,453, Cl. 356-394.000.

Sidewinder Products Corporation: *See*—
Singleton, Robert P., 4,680,994. Cl. 81-57.290.

Sie, Swan T., to Shell Oil Company. Process for producing synthesis gas. 4,681,701, Cl. 252-373.000.

Siebert, Louie P. Motorcycle jack. 4,681,299, Cl. 254-8.00R.

Siegel, Rudolf: *See*—
Doetsch, Werner; and Siegel, Rudolf, 4,681,697, Cl. 252-175.000.
Doetsch, Werner; and Siegel, Rudolf, 4,681,748, Cl. 423-279.000.

Siegel, Sharon B.: *See*—
Brodman, Richard F.; and Siegel, Sharon B., 4,681,117, Cl. 128-642.000.

Siegl, Helene, to Sandoz Ltd. Counteracting cyclosporin organ toxicity. 4,681,754, Cl. 424-10.000.

Siehling, Mark B.: *See*—
Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., 4,682,000, Cl. 219-116.000.

Siemens Aktiengesellschaft: *See*—
Amann, Markus-Christian, 4,682,337, Cl. 372-44.000.
Bozung, Hanns-Gunther; and Nachtigal, Joachim, 4,680,933, Cl. 60-608.000.
Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, 4,682,130, Cl. 333-195.000.
Gradnitzer, Eckhard; and Klautschek, Herwig, 4,682,263, Cl. 361-31.000.
Kern, Josef, 4,682,133, Cl. 335-119.000.
Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, 4,681,540, Cl. 433-126.000.
Marquardt, Rainer; Salzmann, Theodor; and Peppel, Michael, 4,682,278, Cl. 363-58.000.
Moeller, Matthias, 4,681,984, Cl. 136-258.000.
Schreiner, Horst; and Rothkegel, Bernhard, 4,681,702, Cl. 252-518.000.
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.
von Sichart, Frithjof, 4,682,047, Cl. 307-200.00B.

Siemens Corporation: *See*—
Minch, Morris L.; and Wagner, Theodore W., 4,682,356, Cl. 379-347.000.

Siemens-Pacesetter, Inc.: *See*—
Silvian, Sergiu, 4,681,111, Cl. 128-419.0PT.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Colombo, Paolo; Conte, Ubaldo; and Reiner, Alberto, 4,681,755, Cl. 424-486.000.

Sigwardt, Peter L.: *See*—
Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., 4,681,466, Cl. 374-42.000.

Sikora, Scott T., to Tomar Electronics, Inc. Single-ended, self-oscillating DC-DC converter for intermittently energized load having V_{BE} responsive current limit circuit. 4,682,081, Cl. 315-219.000.

Silcox, William H.: *See*—
Bodine, James A.; Kuehn, Judson S.; and Silcox, William H., 4,681,298, Cl. 251-129.100.

Silverberg, Eric C.: *See*—
Krewalk, John J.; and Silverberg, Eric C., 4,682,091, Cl. 318-685.000.

Silvian, Sergiu, to Siemens-Pacesetter, Inc. Analog and digital telemetry system for an implantable device. 4,681,111, Cl. 128-419.0PT.

Sim, Teik P.: *See*—
Richardson, Elvet M.; and Sim, Teik P., 4,680,941, Cl. 62-184.000.

Simkins, Philip P., to Hewitt, Steven W., a part interest. Display case for fragrance bottles, jewelry, or the like, and hinge used therein. 4,681,216, Cl. 206-45.130.

Simm, Wolfgang; and Steine, Hans-Theo, to Castolin S.A. Heat spraying material and manufacturing process thereof. 4,681,734, Cl. 419-9.000.

Simmonds, Robert C., Jr.; Crowell, Douglas H.; and Martin, John F., to USM Corporation. Powder reinforcing laminate apparatus. 4,681,650, Cl. 156-378.000.

Simmons, Howard E., III. Optical recording element. 4,681,834, Cl. 430-270.000.

Simonsen, Jens K.; and Moos, Hans J., to Danfoss A/S. Mass flow meter on the coriolis principle. 4,680,974, Cl. 73-861.380.

Simpson, Dennis A.; Singer, Debra L.; Dowbenko, Rostyslaw; Blackburn, William P.; and Kania, Charles M., to PPG Industries, Inc. Color plus clear coatings employing polyepoxides and polyacid curing agents in the clear coat. 4,681,811, Cl. 428-413.000.

Simpson, Dennis L.: *See—*
Brabb, James D.; and Simpson, Dennis L., 4,681,265, Cl. 239-665.000.

Simpson, Leslie J., to Flight Equipment and Engineering Limited. Reclinable vehicle seats. 4,681,369, Cl. 297-316.000.

Sims, John C., deceased (by Sims, Lucille, executrix); and Mundo, Charles J., Jr., to Sineco, Inc. Optical ranging anti-collision technique and system. 4,681,431, Cl. 356-4.000.

Sims, Lucille, executrix: *See—*
Sims, John C., deceased; and Mundo, Charles J., Jr., 4,681,431, Cl. 356-4.000.

Sineco, Inc.: *See—*
Sims, John C., deceased; and Mundo, Charles J., Jr., 4,681,431, Cl. 356-4.000.

Singer, Debra L.: *See—*
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Singhal, Gopal H.; and Culross, Claude C., to Exxon Research and Engineering Company. Method of preparing hydrocarbon substituted dithiocarbamates of molybdenum. 4,681,957, Cl. 556-38.000.

Singleton, Robert P., to Sidewinder Products Corporation. Socket wrench with reversing ratchet. 4,680,994, Cl. 81-57.290.

SIPRA Patententwicklungs-und Beteiligungsgesellschaft mbH: *See—*
Brunner, Heinz; and Seeger, Stefan, 4,681,272, Cl. 242-47.010.

Sirkin, Robert, to Charles Wyle Engineering Corporation. Solvent pump. 4,681,242, Cl. 222-41.000.

Skarvinko, Eugene P.: *See—*
Clementi, Robert J.; Gazdik, Charles E.; Lafer, William; Lovesky, Roy L.; McBride, Donald G.; Munson, Joel V.; and Skarvinko, Eugene P., 4,681,654, Cl. 156-630.000.

Skelton, John: *See—*
Donovan, James G.; and Skelton, John, 4,681,789, Cl. 428-93.000.

Skraba, Frank W., to Phillips Petroleum Company. Catalytic cracking apparatus. 4,681,743, Cl. 422-140.000.

Skylight Industry Co. Ltd.: *See—*
Ohashi, Keiichi, 4,682,275, Cl. 362-191.000.

Skyline Products, Inc.: *See—*
Stadjuhar, Robert C.; and Renfro, Cecil S., 4,680,883, Cl. 40-471.000.

Sleger, Roger R.; and Walsh, Edward, to Hewlett-Packard Company. Actuator arm bearing preload arrangement for a rotary disc drive. 4,682,255, Cl. 360-106.000.

Sloan, George C.; and Laine, David J. Compact personal hygiene center. 4,680,817, Cl. 4-663.000.

Slusarchyk, William A.; Dejneka, Tamara; Koster, William H.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. 3-acylamino-2-oxo-1-azetidinyl esters of phosphonic acids, phosphoric acid and phosphoric acid esters. 4,681,937, Cl. 540-355.000.

SM Industrial Co., Ltd: *See—*
Nakamura, Daijiro, 4,681,279, Cl. 242-107.300.

Smith, Daniel P.; and Lillquist, Robert D., to General Electric Company. Stimulated scanning infrared imaging system. 4,682,222, Cl. 358-113.000.

Smith, David E., to Aspen Peripherals. Guide for restoring and removing a tape leader block to and from a tape cassette. 4,681,278, Cl. 242-195.000.

Smith, David J. H.: *See—*
Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., 4,681,707, Cl. 260-410.90R.

Smith, Dennis M.: *See—*
Flowers, John E.; Romanowski, Christopher A.; and Smith, Dennis M., 4,681,152, Cl. 164-477.000.

Smith, Forrest P., Jr.; and Munnell, Jeffrey C. Safety firearm mechanism. 4,680,884, Cl. 42-66.000.

Smith, Gregory C.: *See—*
Purdes, Andrew J.; and Smith, Gregory C., 4,681,653, Cl. 156-614.000.

Smith, Ian R.: *See—*
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.

Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.

Smith, Larry C.: *See—*
Crandall, Robert E.; Kosulic, Kenneth F.; Rooney, Thomas C.; and Smith, Larry C., 4,681,033, Cl. 100-118.000.

Smith, Paul D.: *See—*
McDaniel, Max P.; and Smith, Paul D., 4,681,866, Cl. 502-154.000.

Smith, Robert F., to Seagate Technology. Method and apparatus for evaluating a recording system utilizing a programmable window generator having first and second multivibrators providing delay. 4,682,252, Cl. 360-67.000.

Smith, Robert J. Method and apparatus for starting a diesel engine at a subfreezing temperature. 4,681,071, Cl. 123-180.00R.

Smith, Ronald L.: *See—*
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,680,899, Cl. 51-427.000.

Smith, Thomas T. Container opening technology. 4,681,358, Cl. 294-15.000.

Smith, Timothy B.: *See—*
Spence-Bate, Harry A. H.; and Smith, Timothy B., 4,681,429, Cl. 355-73.000.

Snaper, Alvin A. Dental bur with enhanced durability. 4,681,541, Cl. 433-165.000.

Societe Anonyme de Telecommunications: *See—*
Bailly, Francois P.; and Bourgoin, Alain, 4,682,355, Cl. 379-346.000.

Societe Cogema, Framatome et Uranium Pechiney: *See—*
Vere , Bernard; and Mathevon, Paul, 4,680,920, Cl. 53-525.000.

Societe de Conseils de Recherches et d'Applications Scientifiques: *See—*
Esanu, Andre, 4,681,888, Cl. 514-301.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
d'Agostino, Guy; Dhainaut, Andre ; Kettler, Daniel G. A.; and Leclerc, Henry R., 4,681,327, Cl. 277-29.000.

Societe Prolabo: *See—*
Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, 4,681,740, Cl. 422-78.000.

Sodeikat, Dieter, to Messerschmitt-Bolkow-Blohm GmbH. Mechanical vibrator. 4,680,968, Cl. 73-651.000.

Sodeoka, Mikiko: *See—*
Shibasaki, Masakatsu; Mase, Toshiaki; Sodeoka, Mikiko; and Ogawa, Yuji, 4,681,951, Cl. 549-214.000.

Soderberg, Paul B., to Soderberg Research & Development, Inc. Apparatus and method for automatically and periodically introducing a fluid into a producing oil well. 4,681,167, Cl. 166-371.000.

Soderberg Research & Development, Inc.: *See—*
Soderberg, Paul B., 4,681,167, Cl. 166-371.000.

Solarcraft, Inc.: *See—*
Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, 4,680,815, Cl. 2-171.300.

Solaroli, Sergio: *See—*
Danielli, Franco; and Solaroli, Sergio, 4,680,865, Cl. 33-143.00L.

Soltysiak, Peter, to Mannesmann Aktiengesellschaft. Resilient suspension for conduits. 4,681,294, Cl. 248-613.000.

Solvay & Cie: *See—*
Ruelle, Jean-Jacques; d'Andrea, Giacomo; and Asselberghs, Leopold, 4,680,958, Cl. 73-56.000.

Somar Corporation: *See—*
Ebara, Ryohei; and Sano, Shin-ichi, 4,681,784, Cl. 428-40.000.
Nagasawa, Kohtaro; and Morikubo, Kunio, 4,681,833, Cl. 430-175.000.

Somer, Gerald L., to AMP Incorporated. Rf fsk transmitter. 4,682,344, Cl. 375-62.000.

Sommerfeld, Claus-Dieter: *See—*
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.

Sondov, Sten Y.; and From, Jan O., to Interpublic a.s. Tubular trash net for pre-treating sewage, with replaceable net cassette. 4,681,688, Cl. 210-770.000.

Sonex Research, Inc.: *See—*
Pouring, Andrew A., 4,681,072, Cl. 123-193.00P.

Song, Peter: *See—*
Mouche, Richard J.; and Song, Peter, 4,681,687, Cl. 210-764.000.

Sonoda, Hirotetu: *See—*
Suzuki, Yoshio; Sonoda, Hirotetu; and Yabe, Hideo, 4,681,184, Cl. 180-141.000.

Sony Corporation: *See—*
Busby, Bruce E., 4,682,318, Cl. 369-59.000.
David, Morgan W. A.; and Hedley, David J., 4,682,217, Cl. 358-89.000.
Furuya, Tsuneo; and Inazawa, Yoshizumi, 4,682,312, Cl. 369-32.000.
Kikuchi, Masafumi, 4,682,087, Cl. 315-387.000.
Ohta, Teruo, 4,682,322, Cl. 369-291.000.
Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.
Watanabe, Yuji, 4,682,239, Cl. 358-241.000.
Yamakawa, Yoshifumi, 4,682,231, Cl. 358-168.000.

Soprema S.A.: *See—*
Geisen, Pierre; Reillaudoux, Jean-Claude; and Ducret, Bernard, 4,680,913, Cl. 52-746.000.

Sorriaux, Pierre. Switching system with video switching matrix. 4,682,349, Cl. 379-54.000.

Soyama, Hideo: *See—*
Hirama, Shigemitsu; Aida, Satoru; and Soyama, Hideo, 4,680,919, Cl. 53-499.000.

Spangler, Harvey D.; and Lamb, Kenneth V., to Kinetics Technology International Corporation; and Farmland Industries, Corporation. Feed gas saturation system for steam reforming plants. 4,681,603, Cl. 55-27.000.

Spangler, James E.: *See—*
Arterbury, Bryant A.; and Spangler, James E., 4,681,161, Cl. 166-227.000.

Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion protruding-head rivet design and method of installing same. 4,681,499, Cl. 411-507.000.

Spector, George: *See*—
Trahan, Curtis J.; Trahan, Mary C.; and Spector, George, 4,681,195, Cl. 190-2.000.
Spence-Bate, Harry A. H.; and Smith, Timothy B., to Spence-Bate, Joyce Florence. Film lamina handling. 4,681,429, Cl. 355-73.000.
Spence-Bate, Joyce Florence: *See*—
Spence-Bate, Harry A. H.; and Smith, Timothy B., 4,681,429, Cl. 355-73.000.
Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., to Texaco Inc. Phosphorus containing aromatic amino polyols. 4,681,965, Cl. 558-162.000.
Spielau, Paul: *See*—
Engels, Hans-Werner; Neuschaffer, Karlheinz; and Spielau, Paul, 4,681,631, Cl. 106-4.000.
Spirax Sarco Limited: *See*—
Dewhirst, Keith, 4,681,256, Cl. 236-56.000.
Spitaler, Engelbert, to TMC Corporation. Safety ski binding. 4,681,338, Cl. 280-628.000.
Sponagle, G. W.: *See*—
Grauman, R. J.; Sponagle, G. W.; and Rachuk, T. W., 4,680,961, Cl. 73-170.00R.
Sprague, Peter W.: *See*—
Haugwitz, Rudiger D.; and Sprague, Peter W., 4,681,886, Cl. 514-259.000.
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Process for preparing alkyl substituted and unsubstituted para-carboalkoxy cyclohexanones. 4,681,976, Cl. 560-126.000.
Sproul, Robert W.; and Ponzo, Michael F. Phase shifter. 4,682,128, Cl. 333-139.000.
Sprute, Fritz A., to Sherwin-Williams Company, The. Cap connecting propellant container with material container. 4,681,262, Cl. 239-306.000.
Spykerman, Scott A.: *See*—
Hemmeke, Ronald L.; and Spykerman, Scott A., 4,681,363, Cl. 296-97.00G.
Square D Company: *See*—
Dvorak, Robert F.; Netolicky, Charles E.; and Palmer, Neil R., 4,681,061, Cl. 116-279.000.
Sreekumar, Chandra: *See*—
Alexandrovich, Peter S.; Manthey, Joseph W.; May, John W.; and Sreekumar, Chandra, 4,681,828, Cl. 430-97.000.
Sridhar, Bettadapur N.: *See*—
Gassler, Richard D.; and Sridhar, Bettadapur N., 4,681,014, Cl. 89-1.816.
S+T Marketing AG: *See*—
Tritt, Eugen, 4,681,105, Cl. 128-303.170.
Staar S. A.: *See*—
d'Alayer de Costemore d'Arc, Stephane A. M., 4,682,320, Cl. 369-77.100.
Stacks, Ronald R. Method of treating wells with aqueous foam. 4,681,164, Cl. 166-304.000.
Stadjuhar, Robert C.; and Renfro, Cecil S., to Skyline Products, Inc. Scroll module and sign system for internally illuminated signs. 4,680,883, Cl. 40-471.000.
Stahl, Torvald, to Flygt Aktiebolag. Key joint apparatus for assembly of electrical motors. 4,682,069, Cl. 310-261.000.
Standard-Keil Hardware Manufacturing Co.: *See*—
Cook, Sanford L.; and Kirkup, David, 4,680,828, Cl. 16-90.000.
Standard Oil Company, The: *See*—
Budge, John R.; and Compton, Senja V., 4,681,868, Cl. 502-307.000.
Desmond, Michael J.; Currie, Janie K.; and Pesa, Frederick A., 4,681,747, Cl. 423-277.000.
Li, George S.; Wu, Muyen M.; and Dewitt, Elmer J., 4,681,917, Cl. 525-210.000.
Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., 4,681,968, Cl. 558-361.000.
Wu, Muyen M.; Li, George S.; and Dewitt, Elmer J., 4,681,916, Cl. 525-210.000.
Standard Register Co., The: *See*—
Mowry, William H., Jr., 4,681,348, Cl. 283-58.000.
Standard Telephones and Cables Public Limited Company: *See*—
Corfield, Kenneth G.; and Heeks, John S., 4,682,323, Cl. 370-4.000.
Stanford University: *See*—
Bloom, David M.; and Kolner, Brian H., 4,681,449, Cl. 356-364.000.
Stanley, Ann E., to United States of America, Army. Laser-induced chemical vapor deposition of germanium and doped-germanium films. 4,681,640, Cl. 148-1.500.
Stanley Electric Co., Ltd.: *See*—
Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, 4,682,072, Cl. 313-115.000.
Stanley Works, The: *See*—
Roberts, C. Kenard, 4,681,223, Cl. 206-354.000.
Stannard, Forrest B.; and Highstreet, Edward J., to Dehydro Corporation, The. V-shaped trough filters, rotary assemblies thereof and methods of filtering therewith. 4,681,689, Cl. 210-784.000.
Starcosa GmbH: *See*—
Hinck, Karl-Heinz, 4,681,639, Cl. 127-30.000.
State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University: *See*—
Mietzner, Timothy A.; and Morse, Stephen A., 4,681,761, Cl. 424-92.000.
Staub, Norbert, to Alcatel N.V. Electron optics for the electron beam generating system of a color picture tube. 4,682,073, Cl. 313-414.000.
Stauffer Chemical Company: *See*—
Ayen, Richard J.; Burk, Johst H.; and Greco, Carl C., 4,681,959, Cl. 556-54.000.
Lee, David L.; and Michaely, William J., 4,681,621, Cl. 71-103.000.
Paterson, Karol E.; and Everett, Nicholas P., 4,681,849, Cl. 435-240.000.
Staufner, Helmut. Conveying apparatus for the processing of printed items. 4,681,502, Cl. 414-121.000.
Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, to BASF Aktiengesellschaft. Preparation of chloro-olefins. 4,681,977, Cl. 560-262.000.
Stefani, Fabrizio: *See*—
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.
Stefko, Bela: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.
Stefnik, William S.; and Grims, Frank J. Unitized partition system. 4,680,902, Cl. 52-126.400.
Steine, Hans-Theo: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,681,734, Cl. 419-9.000.
Steininger, Hugh D.: *See*—
Fulmer, Keith H.; Peebles, Arthur K.; and Steininger, Hugh D., 4,681,196, Cl. 192-3.00H.
Stelma, Michael J.; and Dehem, Paul R. Drummer's glove. 4,681,012, Cl. 84-422.00S.
Sten, Matti: *See*—
Forss, Kaj; Sten, Matti; Peltonen, Juhani; and Jokela, Veikko, 4,681,935, Cl. 536-56.000.
Stendel, Wilhelm: *See*—
Ingendoh, Axel; Scheinert, Wolfgang; Becker, Benedikt; Halcour, Kurt; and Stendel, Wilhelm, 4,681,892, Cl. 514-378.000.
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, to United States of America, Commerce. Deoxyribonucleic acid molecules useful as probes for detecting oncogenes incorporated into chromosomal DNA. 4,681,840, Cl. 435-6.000.
Stern, Beth A.; and Holtman, Dennis C., to Personal Products Company. Disposable urinary and fecal waste containment product. 4,681,577, Cl. 604-378.000.
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, to Siemens Aktiengesellschaft. Magnetic resonance equipment for the production of images of a test object. 4,682,108, Cl. 324-309.000.
Stetter, Jorg: *See*—
Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Santel, Hans-Joachim; and Schmidt, Robert R., 4,681,618, Cl. 71-92.000.
Stewart, John: *See*—
Gronlund, Robert L.; and Stewart, John, 4,681,289, Cl. 248-224.400.
Stewart, Leo J. Locking device for articles such as sailboards. 4,680,949, Cl. 70-14.000.
Stewart, Victor M., to Industrial Research Development, Inc. Roofing system. 4,680,909, Cl. 52-409.000.
Sticht, Walter. Modular machine table for production plants. 4,681,043, Cl. 108-153.000.
Stiefel, Edward I.: *See*—
Halbert, Thomas R.; and Stiefel, Edward I., 4,681,958, Cl. 556-42.000.
Stiefel Laboratories, Inc.: *See*—
Stiefel, Werner K.; and Breunig, Charles F., 4,681,635, Cl. 106-178.000.
Stiefel, Werner K.; and Breunig, Charles F., to Stiefel Laboratories, Inc. Topical collodion compositions. 4,681,635, Cl. 106-178.000.
Stier, Michael A.: *See*—
Kaltenbronn, James S.; and Stier, Michael A., 4,681,972, Cl. 560-29.000.
Stille, Volker: *See*—
Lodige, Rudolf; Leonhard, Bernhard; and Stille, Volker, 4,681,211, Cl. 198-789.000.
Stoecker, Don R. Mobile home skirting system. 4,680,904, Cl. 52-169.120.
Stolz, Hermann, to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG. Belt gripping device. 4,681,359, Cl. 294-81.210.
Stops, Peter: *See*—
Baur, Karl G.; Diehl, Volker; Stops, Peter; Hellbach, Hans; and Brunner, Erwin, 4,681,946, Cl. 546-317.000.
Stout, Donald E.: *See*—
McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., 4,682,299, Cl. 364-569.000.
Stoutamire, Donald W.; and Tieman, Charles H. Preparation of optically-active cyanomethyl esters. 4,681,947, Cl. 544-370.000.
Strain Measurement Devices Limited: *See*—
Johnson, Harvey R., 4,680,858, Cl. 29-610.0SG.
Strato Medical Corporation: *See*—
Fenton, Paul V., Jr.; Miller, Robert L.; and Santin, Ernest M., 4,681,566, Cl. 604-135.000.
Strauss, Leopold: *See*—
Hayduchok, Leon; and Strauss, Leopold, 4,681,471, Cl. 401-34.000.
Straza, George C. P.: *See*—
Straza, George T.; and Straza, George C. P., 4,681,322, Cl. 273-173.000.

Straza, George T.; and Straza, George C. P. Golf club head. 4,681,322, Cl. 273-173.000.
Streck, Roland: *See—*
Zerpner, Dieter; Streck, Roland; and Haag, Horst G., 4,681,961, Cl. 556-428.000.
Strelecki, Paul R.: *See—*
Boozer, James M.; Mayer, Robert W.; Kumasaka, Alan J.; Strelecki, Paul R.; and Lindlau, Paul F., 4,682,153, Cl. 340-507.000.
Strepparola, Ezio; and Re, Alberto, to Ausimont S.p.A. Fluorinated polyacrylates and polyacrylamides having a controlled cross-linking degree, and process for preparing same. 4,681,925, Cl. 526-246.000.
Strepparola, Ezio: *See—*
Gavezotti, Piero; and Strepparola, Ezio, 4,681,693, Cl. 252-49.900.
Stretton, Reginald J.: *See—*
Marples, Brian A.; and Stretton, Reginald J., 4,681,876, Cl. 514-182.000.
Stricklin, Billy C.: *See—*
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
Strolle, Clifford H.: *See—*
Rutkiewic, Andrew F.; and Strolle, Clifford H., 4,681,815, Cl. 428-458.000.
Strubel, David G.; and Sanford, Robert A., to Brown & Williamson Tobacco Corporation. Process for manufacturing reconstituted tobacco. 4,681,126, Cl. 131-370.000.
Styrna, Zbigniew B.: *See—*
Ramsay, John R.; and Styrna, Zbigniew B., 4,682,328, Cl. 371-13.000.
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Light measuring device. 4,681,420, Cl. 354-409.000.
Sugano, Kazuhiko: *See—*
Hayasaki, Koichi; and Sugano, Kazuhiko, 4,680,992, Cl. 74-869.000.
Sugimoto, Takao: *See—*
Yamanaka, Teruo; Sugimoto, Takao; and Hayakawa, Kizo, 4,680,960, Cl. 73-117.300.
Sugino, Hiromu: *See—*
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
Sugishita, Susumu: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,681,519, Cl. 418-152.000.
Sugita, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Curvilinear escalator. 4,681,206, Cl. 198-328.000.
Sugita, Yasutoshi, to Canon Kabushiki Kaisha. Apparatus for image posture correction. 4,682,242, Cl. 358-285.000.
Sugiura, Kengo: *See—*
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
Sugiyama, Takekatsu: *See—*
Iwakura, Ken; and Sugiyama, Takekatsu, 4,682,193, Cl. 503-209.000.
Sugiyama, Yasuo: *See—*
Onishi, Ken; and Sugiyama, Yasuo, 4,682,333, Cl. 371-39.000.
Sukornick, Bernard: *See—*
Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., 4,681,823, Cl. 429-218.000.
Sullivan Corporation: *See—*
Oberhofer, David P., 4,681,270, Cl. 241-298.000.
Sullivan, Daniel T.: *See—*
DeFreitas, Richard E.; and Sullivan, Daniel T., 4,682,362, Cl. 381-61.000.
Sullivan, Thomas M., to Chrysler Motors Corporation. Power memory seat and mirror control system. 4,682,088, Cl. 318-568.000.
Sulzer Brothers Limited: *See—*
Juzi, Heniz; and Bernasconi, Marco L., 4,681,129, Cl. 137-154.000.
Sulzer-Escher Wyss Limited: *See—*
Bartesch, Helmut; and Florin, Gerd, 4,681,029, Cl. 99-483.000.
Sumitomo Chemical Company, Ltd.: *See—*
Araki, Masashi; and Hibi, Takuo, 4,681,979, Cl. 585-640.000.
Tsunewaki, Koichiro; and Ohtsuka, Ichiro, 4,680,888, Cl. 47-58.000.
Sumitomo Electric Industries, Ltd.: *See—*
Ono, Kimizo; and Nishimura, Akira, 4,681,093, Cl. 128-6.000.
Ueba, Yoshinobu; and Miyake, Shinichi, 4,681,400, Cl. 350-96.340.
Sumitomo Metal Mining Company Limited: *See—*
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.
Summers, David G.: *See—*
Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.
Sunaga, Kazuyuki: *See—*
Hashimoto, Shingo; Sunaga, Kazuyuki; and Kasugai, Kaoru, 4,682,254, Cl. 360-103.000.
Sundholm, Goran, to GS-Hydro Oy. Joint for a pipe provided with a flared end. 4,681,352, Cl. 285-334.100.
Sundstrand Corporation: *See—*
Short, Keith E., 4,680,934, Cl. 60-652.000.
Sung, Rodney L.: *See—*
Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.
Sunouchi, Akio: *See—*
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
Sunwa Sharyo Manufacturing Co., Ltd.: *See—*
Misawa, Rintaro, 4,681,330, Cl. 280-47.200.
Sutherland, Hugh F., II: *See—*
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.
Sutton, Paul M.; and Peplinski, Joseph, to Dorr-Oliver Inc. Method and apparatus for concentrating bioparticles. 4,681,685, Cl. 210-618.000.
Suwa, Kaname, to Canon Kabushiki Kaisha. Electronic equipment having a key input function. 4,681,987, Cl. 200-5.00A.
Suzuki, Atsushi: *See—*
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Kaneta, Keisuke, 4,681,079, Cl. 123-491.000.
Suzuki, Masanori: *See—*
Utsumi, Kazuaki; Ochi, Atsushi; Suzuki, Masanori; and Midorikawa, Mitsuhiro, 4,681,667, Cl. 204-15.000.
Suzuki, Masao: *See—*
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.
Suzuki, Nobuyuki: *See—*
Suda, Yasuo; Alyfuku, Kiyoshi; Sunouchi, Akio; and Suzuki, Nobuyuki, 4,681,420, Cl. 354-409.000.
Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,681,441, Cl. 356-222.000.
Suzuki, Osamu: *See—*
Oishi, Kengo; and Suzuki, Osamu, 4,682,260, Cl. 360-133.000.
Suzuki, Yoshiaki: *See—*
Mifune, Hiroyuki; Shishido, Tadao; and Suzuki, Yoshiaki, 4,681,838, Cl. 430-367.000.
Suzuki, Yoshifumi: *See—*
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.
Suzuki, Yoshio; Ohe, Takeshi; and Koike, Ichiro, to Jidosha Kiki Co., Ltd. Electric power steering apparatus. 4,681,182, Cl. 180-79.100.
Suzuki, Yoshio; Sonoda, Hirotetu; and Yabe, Hideo, to Jidosha Kiki Co., Ltd. Hydraulic reaction force apparatus for power steering system. 4,681,184, Cl. 180-141.000.
Swab, John M.: *See—*
Wang, Samuel C.; Swab, John M.; Winn, Michael L.; and Gibbons, Martin D., 4,682,236, Cl. 358-213.260.
Swan, Jack C., Jr.; and Poggioli, Paolo, to Cobe Laboratories, Inc. Drip chamber. 4,681,606, Cl. 55-193.000.
Swanson, Scott C., to Sangamo Weston, Inc. Method of and system for accumulating verifiable energy demand data from remote electricity meters. 4,682,169, Cl. 379-104.000.
Swartout, Willson C. Passive automobile seat belt reminding device. 4,681,345, Cl. 280-801.000.
Swartz, Mitchell R. Systems to preserve living tissue. 4,681,839, Cl. 435-1.000.
Swengel, Robert C., Sr., to Donsco Incorporated. Oscillating device having improved support legs. 4,681,314, Cl. 272-52.000.
Swenson, Paul F., Jr.; and Heinrich, Charles E., to TRD Corporation. Pump for saturated liquid. 4,681,510, Cl. 415-168.000.
Swift, Joseph A.: *See—*
Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.
Switchcraft, Inc.: *See—*
Bailey, James R.; and Long, Eric L., 4,681,398, Cl. 350-96.200.
Sykora, Jan; and Wangler, Jan, to PRAGA-Zavody Klementa Gottwalda, narodni podnik. Hydraulic shift control device for an automatic transmission having two gear ratios. 4,680,989, Cl. 74-867.000.
Syntex (U.S.A.) Inc.: *See—*
Clark, Robin; Muchowski, Joseph M.; Chiu, Fang-Ting; Gardner, John O.; and Berger, Jacob, 4,681,889, Cl. 514-307.000.
Syzdykov, Askar K.: *See—*
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.
Szalay, Otto : *See—*
Nagy, Zoltan; Hupka, Gyorgy; Szalay, Otto ; and Kovacs, Attila, 4,681,531, Cl. 431-181.000.
Szasz, Tibor: *See—*
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Sziklas, Edward A.; and Palma, Gary E., to United Technologies Corporation. Laser array having mutually coupled resonators. 4,682,339, Cl. 372-95.000.
Szombathelyi, Zsolt: *See—*
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.
Szporny, Laszlo : *See—*
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny,

Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.
Tabata, Osamu; Inagaki, Hazime; and Kitano, Tomoyuki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Semiconductor flow velocity sensor. 4,680,963, Cl. 73-204.000.
Tabei, Masatoshi: *See*—
Inuiya, Masafumi; and Tabei, Masatoshi, 4,682,212, Cl. 358-44.000.
Tabor, Elhanan, to "AR-KAL" Plastics Products (1973). Combined pressure regulated and check valve. 4,681,130, Cl. 137-220.000.
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, to Fuji Photo Film Co., Ltd. Electrophotographic liquid developer. 4,681,832, Cl. 430-115.000.
Taddei, Lorenzo, to Comet - Construzione Occhiali Metallo S.p.A. Eyeglass nosepiece holder. 4,681,411, Cl. 351-137.000.
Taguchi, Junji: *See*—
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
Tai Cheong Blinds Company Ltd.: *See*—
Tung-Chow, Siu, 4,681,149, Cl. 160-134.000.
Taipale, Dale L.; and Brome, John G., to Brandt, Inc. Electronic control for totaling denominations of several countries. 4,682,288, Cl. 364-406.000.
Takagi, Hitoshi: *See*—
Mita, Seiichi; Izumita, Morishi; Michikawa, Yuichi; Katayama, Hitoshi; Shiono, Hiroshi; Takagi, Hitoshi; Rokuda, Morito; and Doi, Nobukazu, 4,682,115, Cl. 328-164.000.
Takahashi, Akira: *See*—
Oyama, Fusami; and Takahashi, Akira, 4,681,180, Cl. 180-76.000.
Takahashi, Kiyofumi: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,681,820, Cl. 428-698.000.
Takahashi, Mizunori: *See*—
Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, 4,681,909, Cl. 524-272.000.
Takahashi, Toshio: *See*—
Hayase, Yoshio; Ichinari, Mitsuhiro; Taguchi, Junji; Ishiguro, Takeo; and Takahashi, Toshio, 4,681,874, Cl. 514-90.000.
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing magnetic recording media. 4,681,669, Cl. 204-35.100.
Takahashi, Tsutomu, to NEC Corporation. Mobile radio data communication system using a speech recognition technique. 4,682,368, Cl. 455-38.000.
Takahatake, Yuriko: *See*—
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,681,953, Cl. 549-65.000.
Takaku, Shigetake: *See*—
Hama, Yasuo; and Takaku, Shigetake, 4,680,969, Cl. 73-661.000.
Takano, Hiroshi: *See*—
Ikemura, Yuichi; and Takano, Hiroshi, 4,682,210, Cl. 358-29.000.
Takaoka, Takashi; Koyahara, Satoru; and Saito, Tetsuo, to Kabushiki Kaisha Toshiba. Optical recording medium. 4,682,321, Cl. 369-284.000.
Takase Dyeing & Printing Works, Ltd.: *See*—
Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.
Takasugi, Mitsuo, to Colpo Co., Ltd. Cartridge with plug opening mechanism. 4,681,243, Cl. 222-83.000.
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, to Canon Kabushiki Kaisha. Capacitor coupled circuit. 4,682,232, Cl. 358-172.000.
Takechi, Tamaki: *See*—
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.
Takeda Chemical Industries Ltd.: *See*—
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 4,681,930, Cl. 530-351.000.
Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, 4,681,848, Cl. 435-240.000.
Takeda, Hideo: *See*—
Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.
Takeda, Hiromitsu: *See*—
Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, to Tokyo Keiki Company Limited. Set point change-over circuit for fluid control valves. 4,682,166, Cl. 340-825.500.
Takeuchi, Makoto: *See*—
Saito, Toshinori; and Takeuchi, Makoto, 4,681,513, Cl. 417-2.000.
Takeuchi, Nobuo: *See*—
Hotate, Makoto; Kaneko, Tadashi; Nishikawa, Toshio; Nakazumi, Tadataka; and Takeuchi, Nobuo, 4,682,044, Cl. 290-40.000.
Takeuchi, Tetsuhiko: *See*—
Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, 4,681,615, Cl. 65-18.100.
Takeuchi, Yoshimitsu: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,682,191, Cl. 503-200.000.
Tamari, Masumi, to Kabushiki Kaisha Toshiba. Robot control system. 4,682,089, Cl. 318-568.000.
Tamba, Shinichi; Miyake Hitomi; Fukui Noboru; and Miguchi, Akio, to Kawasaki Jukogyo Kabushiki Kaisha. Liquid-cooled engine of the vertical shaft type. 4,681,067, Cl. 123-41.100.
Tamfelt Oy AB: *See*—
Cedercreutz, Axel; and Salminen, Ari, 4,681,287, Cl. 245-6.000.
Tamura, Kaoru; and Torii, Shumpeita, to Fuji Photo Film Co., Ltd. Cassette for stimulable phosphor sheet. 4,681,227, Cl. 206-455.000.
Tamura, Keiichi; Nishimura, Yuji; and Kawaharazaki, Takashi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt apparatus. 4,681,347, Cl. 280-804.000.
Tan, Siv C.; Le Galle, Didier; and Benchimol, Claude, to Thomson - CGR. Method of reconstructing a high resolution image by tomodensitometry. 4,682,290, Cl. 364-414.000.
Tanaka, Hiroshi; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Method of adjusting radiation image read-out conditions. 4,682,028, Cl. 250-327.200.
Tanaka, Masanori: *See*—
Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, 4,681,749, Cl. 423-326.000.
Tanaka, Shigeru: *See*—
Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, 4,681,154, Cl. 165-47.000.
Tanaka, Toshiharu: *See*—
Usami, Toshimasa; Tanaka, Toshiharu; and Yoshida, Shohei, 4,682,194, Cl. 503-215.000.
Tanaka, Yasunori: *See*—
Shibata, Norio; Takeda, Hideo; Sato, Tsunehiko; and Tanaka, Yasunori, 4,681,062, Cl. 118-410.000.
Taniguchi, Toshihiko; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Illuminating angle adjusting apparatus for an electronic flash device. 4,682,273, Cl. 362-18.000.
Tanihata, Ryoichi: *See*—
Inoue, Masayoshi; Hirano, Kenichiro; and Tanihata, Ryoichi, 4,682,353, Cl. 379-163.000.
Tanimoto, Yasufumi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,681,425, Cl. 355-14.0CU.
Tanizawa, Tetsu, to Fujitsu Limited. Master slice IC device. 4,682,202, Cl. 357-45.000.
Tansey, John. Femoral stem prosthesis. 4,681,590, Cl. 623-23.000.
Tasaki, Takanobu; and Nagashima, Akira, to Kioritz Corporation. Intake silencer. 4,681,188, Cl. 181-229.000.
Tate, Steven H.: *See*—
Disher, Brennan C.; and Tate, Steven H., 4,681,173, Cl. 175-7.000.
Tateho Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawabe, Tadashi; and Kobune, Masafumi, 4,681,862, Cl. 501-108.000.
Tateoka, Masamichi; and Yano, Hideaki, to Canon Kabushiki Kaisha. Optical information processing apparatus for light beam focus detection and control. 4,682,316, Cl. 369-46.000.
Taylor, Jimmie. Top for motorcycles and snowmobiles. 4,681,362, Cl. 296-78.100.
Taylor, Kenneth: *See*—
Whitehead, Graham K.; and Taylor, Kenneth, 4,682,270, Cl. 361-401.000.
TBI: *See*—
Barben, Theodore R., II, 4,682,113, Cl. 324-441.000.
TDK Corporation: *See*—
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,682,259, Cl. 360-132.000.
Satoh, Takateru; Shiba, Haruo; and Nunokawa, Eiichi, 4,682,258, Cl. 360-132.000.
Teijin Seiki Company Limited: *See*—
Yamakawa, Tsuyoshi, 4,682,135, Cl. 335-256.000.
Tektronix, Inc.: *See*—
Tierney, Lannie J., 4,682,304, Cl. 364-900.000.
Telefonaktiebolaget LM Ericsson: *See*—
Akerberg, Dag E., 4,682,350, Cl. 379-61.000.
Hagelin, Frank H., 4,682,100, Cl. 324-117.00R.
Temple, Chester S.: *See*—
Hsu, Ed C.; and Temple, Chester S., 4,681,658, Cl. 162-156.000.
Teradyne, Inc.: *See*—
Pitasi, Martin J., 4,682,269, Cl. 361-386.000.
Teramachi, Hiroshi. Table feed apparatus. 4,681,506, Cl. 414-749.000.
Teramae, Hiroshi; and Yoshimura, Yoshinari, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc. 4,681,201, Cl. 192-106.200.
Terasawa, Koji, to Canon Kabushiki Kaisha. Suction recovering device for an ink jet printer and ink jet printer having the same device. 4,682,184, Cl. 346-140.00R.
Terita, Robert S., to Bead Chain Manufacturing Company. Swaged compliant connector pins for printed circuit boards. 4,681,392, Cl. 439-751.000.
Terlecky, Boris S.: *See*—
Brodeur, Rene H.; and Terlecky, Boris S., 4,681,040, Cl. 105-3.000.
Terumo Kabushiki Kaisha: *See*—
Yamamoto, Yuichi, 4,681,582, Cl. 604-890.000.
Teschemacher, Hansjorg; Brantl, Victor; Henschen, Agnes; and Lottspeich, Friedrich. Pharmacologically active peptides. 4,681,871, Cl. 514-15.000.
Teubler, Heinz: *See*—
Schulz, Rene ; Teubler, Heinz; and Breuer, Peter, 4,681,517, Cl. 417-300.000.
Te Velde, Ties S.; and Van de Venne, Joannes L. M., to U.S. Philips Corporation. Display device with micromechanical leaf spring switches. 4,681,403, Cl. 350-334.000.
Teves, Alfred: *See*—
Belart, Juan, 4,681,375, Cl. 303-114.000.
Texaco Inc.: *See*—
Chien, Sze-Foo; Redus, Clifford L.; and Sigwardt, Peter L., 4,681,466, Cl. 374-42.000.

Disher, Brennan C.; and Tate, Steven H., 4,681,173, Cl. 175-7.000.
Speranza, George P.; Brennan, Michael E.; and Grigsby, Robert A., Jr., 4,681,965, Cl. 558-162.000.
Vasconcellos, Stephen R.; Najjar, Mitri S.; and Garcia, Ralph, 4,681,700, Cl. 252-373.000.
Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., 4,681,694, Cl. 252-51.50R.

Texas Instruments Incorporated: *See—*
Purdes, Andrew J.; and Smith, Gregory C., 4,681,653, Cl. 156-614.000.
Schrader, Elliott G., 4,682,369, Cl. 455-127.000.

Theeuwes, Felix: *See—*
Urquhart, John; and Theeuwes, Felix, 4,681,583, Cl. 604-892.000.

Theissen, Robert J., to Rhone-Poulenc Agrochimie. Substituted phenoxybenzoic acids and derivatives thereof as herbicides. 4,681,622, Cl. 71-108.000.

Thelen, Werner, to G. Siempelkamp GmbH & Co. Conveyor for particleboard-making apparatus. 4,681,523, Cl. 425-168.000.

Thermotechnik G. Bauknecht GmbH: *See—*
Meiser, Roland; Burkert, Josef; and Bendel, Ralf, 4,682,009, Cl. 219-377.000.

Thiel, David V., to Griffith University. Phase shift keying and phase modulation transmission system. 4,682,118, Cl. 329-122.000.

Thievessen, Karl; and Weiss, Peter, to Jagenberg Aktiengesellschaft. Method and device for attaching a web of material rolling to the beginning of a wound fresh web. 4,681,274, Cl. 242-58.300.

Thomas, Kenneth C.: *See—*
Duncan, Alexander W. S.; Summers, David G.; and Thomas, Kenneth C., 4,681,902, Cl. 521-85.000.

Thomas, Scipio. Pneumatic seat support with linkage and horizontal shock absorbers. 4,681,292, Cl. 248-584.000.

Thompson, Marion L. Energy absorbing barrier. 4,681,302, Cl. 256-13.100.

Thomson - CGR: *See—*
Tan, Siv C.; Le Galle, Didier; and Benchimol, Claude, 4,682,290, Cl. 364-414.000.

Thomson CSF: *See—*
Lazarus, Michel, 4,682,175, Cl. 342-165.000.
Magarshack, John, 4,682,127, Cl. 333-103.000.
Michel, Jean, 4,682,119, Cl. 330-149.000.
Moy, Jean P., 4,682,018, Cl. 250-211.00R.

Thorn, Gernot, to Leybold-Heraeus GmbH. Apparatus for electrically contactlessly measuring the thickness of electrically conducting thin films on non-conducting travelling webs in vacuum deposition apparatus. 4,682,105, Cl. 324-230.000.

Thorp, Bruce E.: *See—*
Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.

Thorpe, Paul, to General Electric Company, p.l.c., The. Lamps and ribbon seals. 4,682,071, Cl. 313-43.000.

Thrall Car Manufacturing Company: *See—*
Harris, William H.; Klag, James P.; and Lam, Joseph W., 4,681,041, Cl. 105-355.000.

Tickner, Ernest G.: *See—*
Rasor, Julia S.; and Tickner, Ernest G., 4,681,119, Cl. 128-660.000.

Tieman, Charles H.: *See—*
Stoutamire, Donald W.; and Tieman, Charles H., 4,681,947, Cl. 544-370.000.

Tierney, Lannie J., to Tektronix, Inc. Asynchronous multiple buffered communications interface having an independent microprocessor for controlling host/peripheral exchanges. 4,682,304, Cl. 364-900.000.

Tiffany, Carlton R. Rainbow projector. 4,681,402, Cl. 350-286.000.

Tillman, Alfred J., to Moog, Inc. Time-delay valve. 4,681,135, Cl. 137-489.500.

Timm, Klaus: *See—*
Ehle, Joachim; Timm, Klaus; and Ahlers, Heinfried, 4,682,341, Cl. 373-99.000.

Timmers, Richard E. Auxiliary seat. 4,681,367, Cl. 297-232.000.

Ting, Sai-Pei: *See—*
Bates, Gary M.; Chambers, Gregory R.; and Ting, Sai-Pei, 4,681,915, Cl. 525-148.000.

Tleuov, Murat G.: *See—*
Aubakirov, Marat T.; Limanov, Esengali L.; Syzdykov, Askar K.; Abdrazakov, Ravil S.; Tleuov, Murat G.; Khazhuer, Vladimir S.; Buzdov, Ruslan D.; and Khashirov, Vladislav K., 4,681,174, Cl. 175-330.000.

TMC Corporation: *See—*
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Spitaler, Engelbert, 4,681,338, Cl. 280-628.000.

Tocci, Mario P.: *See—*
Gill, Frederick A.; and Tocci, Mario P., 4,681,798, Cl. 428-215.000.

Toho Development Engineering Co., Ltd.: *See—*
Kobari, Osamu; and Kida, Takashi, 4,681,535, Cl. 432-48.000.

Tojo, Akihiko: *See—*
Takayama, Tsutomu; Hashimoto, Seiji; Kaji, Toshio; Suzuki, Masao; and Tojo, Akihiko, 4,682,232, Cl. 358-172.000.

Tokai Kogyo Co., Ltd.: *See—*
Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.

Tokarz, Joseph S.; and Jensen, Marvin E., to Hollister Incorporated. Female urinary incontinence device. 4,681,572, Cl. 604-329.000.

Toki, Motoyuki; Kanbe, Sadao; Miyashita, Satoru; and Takeuchi, Tetsuhiko, to Seiko Epson Kabushiki Kaisha. Silica glass formation process. 4,681,615, Cl. 65-18.100.

Tokura, Go: *See—*
Yamada, Akira; and Tokura, Go, 4,681,421, Cl. 354-485.000.

Tokushima, Tadao: *See—*
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.

Tokyo Aircraft Instrument Co., Ltd.: *See—*
Nakamura, Shuji, 4,682,171, Cl. 340-975.000.

Tokyo Electric Co., Ltd.: *See—*
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.

Tokyo Keiki Company Limited: *See—*
Takeuchi, Kunihiko; Baba, Fujio; Shimomura, Yasuo; and Morishige, Yuji, 4,682,166, Cl. 340-825.500.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Komatsu, Shuichi; Shimotori, Kazumi; Takeda, Hiromitsu; and Nakahashi, Masako, 4,681,251, Cl. 228-208.000.
Nishihara, Eitaro, 4,682,289, Cl. 364-414.000.
Shiozaki, Masakazu; and Nishimura, Hidetaro, 4,682,204, Cl. 357-51.000.

Tomar Electronics, Inc.: *See—*
Sikora, Scott T., 4,682,081, Cl. 315-219.000.

Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, to Nihon Sanmo Dyeing Co., JPX. Method of producing an electrically conductive polymeric material with adsorbed metal sulfide and product. 4,681,820, Cl. 428-698.000.

Tomioka, Kunio: *See—*
Miki, Toshiyuki; Tomioka, Kunio; Nakajima, Masao; and Sakurai, Terushige, 4,681,210, Cl. 198-468.200.

Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Subcode signal reading circuit in an optical type disc player. 4,682,317, Cl. 369-59.000.

Tomita, Yoshifumi, to Hitachi, Ltd. Method of manufacturing fluorescent screens of color picture tubes. 4,681,824, Cl. 430-24.000.

Tomoda, Toshimasa: *See—*
Wakayama, Naoaki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.

Toray Silicone Co., Ltd.: *See—*
Saito, Masayuki; and Hamada, Mitsuo, 4,681,636, Cl. 106-287.150.

Torazzina, Aldo: *See—*
Palara, Sergio; and Torazzina, Aldo, 4,682,120, Cl. 330-298.000.
Villa, Flavio; Murari, Bruno; Bertotti, Franco; Torazzina, Aldo; and Stefani, Fabrizio, 4,682,197, Cl. 357-36.000.

Torii, Kuniyoshi: *See—*
Mimasu, Takeo; and Torii, Kuniyoshi, 4,681,757, Cl. 424-47.000.

Torii, Shumpeita: *See—*
Tamura, Kaoru; and Torii, Shumpeita, 4,681,227, Cl. 206-455.000.

Torimaru, Takashi: *See—*
Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.

Torkelson, Arnold: *See—*
Evans, Edwin R.; and Torkelson, Arnold, 4,681,913, Cl. 524-862.000.

Toro Company, The: *See—*
Cochran, Wilson V., 4,681,260, Cl. 239-240.000.

Toshiaki, Ishii, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an elevator. 4,681,190, Cl. 187-101.000.

Toshiyuki Hamaoka Daiichi Seiyaku Co., Ltd.: *See—*
Hamaoka, Toshiyuki; Fujiwara, Hiromi; and Kusama, Tsuneo, 4,681,856, Cl. 536-53.000.

Tossounian, Jacques L.: *See—*
Mergens, William J.; Newmark, Harold L.; Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,681,756, Cl. 424-451.000.

Total Compagnie Francaise des Petroles S.A.: *See—*
Roca, Yves; Rousset, Jacky; Bouchut, Pierre; Leblanc, Marie-Christine; and Baffreau, Daniel, 4,681,634, Cl. 106-90.000.

Totsune, Atsushi: *See—*
Noguchi, Kunio; Totsune, Atsushi; Kajita, Koji; and Hosaka, Takefumi, 4,681,078, Cl. 123-490.000.

Tottori University: *See—*
Sato, Toru; Okazaki, Naoto; and Fujii, Katsumasa, 4,681,099, Cl. 128-204.230.

Toussant, John W.; and Blaney, Ted L., to Procter & Gamble Co., The. Absorbent article having reservoirs. 4,681,579, Cl. 604-385.00R.

Toyama, Kenji: *See—*
Kojima, Koichi; Jujo, Akihiro; Okabayashi, Masanori; Shimatani, Ryoichi; Toyama, Kenji; and Kanzaki, Nobuyoshi, 4,681,672, Cl. 204-129.400.

Toyo Boseki Kabushiki Kaisha: *See—*
Miyagi, Morio; Ohno, Makoto; and Kanaizumi, Masaru, 4,681,713, Cl. 264-41.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Matsumoto, Kunio; and Hirata, Tsutomu, 4,681,841, Cl. 435-18.000.

Toyoda, Tsunehiko: *See—*
Sakakibara, Takao; Toyoda, Tsunehiko; and Nagashima, Yoshihisa, 4,681,712, Cl. 264-24.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Ohashi, Kaoru; and Nomura, Yoshihisa, 4,681,374, Cl. 303-106.000.

Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,681,373, Cl. 303-106.000.

Nonoyama, Hideo; Fukuizumi, Toshiharu; and Morita, Akiyoshi, 4,681,642, Cl. 148-321.000.

Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Yoshitsugu, Noritada, 4,681,346, Cl. 280-804.000.

Trahan, Curtis J.; Trahan, Mary C.; and Spector, George. Carry bag convertible to a mat. 4,681,195, Cl. 190-2.000.

Trahan, Mary C.: *See*—
Trahan, Curtis J.; Trahan, Mary C.; and Spector, George, 4,681,195, Cl. 190-2.000.

Trailer Train Company: *See*—
Brodeur, Rene H.; and Terlecky, Boris S., 4,681,040, Cl. 105-3.000.

Trans-Guard Industries, Inc.: *See*—
Brammall, Terrence; and Guiler, Richard S., 4,681,355, Cl. 292-323.000.
Brammall, Terrence N., 4,681,356, Cl. 292-327.000.

Trans-Lux Corporation: *See*—
Holloman, Charles J., 4,682,162, Cl. 340-799.000.

Trautwein, Hans-Juergen: *See*—
Mueller, Sieghard; Braun, Hermann; Dumschat, Helmut; and Trautwein, Hans-Juergen, 4,680,954, Cl. 72-405.000.

Traxler, Peter, to Ciba-Geigy Corporation. Novel polycyclic hydrazones of rifamycins, their manufacture, and their pharmaceutical compositions for treating tuberculosis. 4,681,938, Cl. 540-458.000.

TRD Corporation: *See*—
Swenson, Paul F., Jr.; and Heinrich, Charles E., 4,681,510, Cl. 415-168.000.

Treleaven, Richard J.: *See*—
Matkan, Josef; and Treleaven, Richard J., 4,681,806, Cl. 428-402.210.

Trexler, Charles J.: *See*—
Bakermans, Frank C.; and Trexler, Charles J., 4,682,129, Cl. 333-184.000.

Tribe, David E., to Austgen-Biojet International Pty, Ltd. Novel microorganism and method. 4,681,852, Cl. 435-108.000.

Trig, Inc.: *See*—
Hickling, Colin D., 4,682,141, Cl. 337-379.000.

Trischler, Ferenc: *See*—
Megyeri, Gabor; Keve, Tibor; Stefko, Bela; Bogsch, Erik; Galambos, Janos; Kassainee Zieger, Anna; Trischler, Ferenc; Palosi, Eva; Groo, Dora; Karpati, Egon; Szombathelyi, Zsolt; Szporny, Laszlo ; Kiss, Bela; Laszlovszky, Istvan; and Lapis, Erzsebet, 4,681,887, Cl. 514-284.000.

Tritt, Eugen, to S+T Marketing AG. Microsurgical tool. 4,681,105, Cl. 128-303.170.

Troester, Thomas F. Continuously variable transmission with epicyclic constant mesh gearing. 4,680,985, Cl. 74-785.000.

Tronzo, Raymond G. Adjustable acetabular cup prosthesis as part of a total cup replacement system. 4,681,589, Cl. 623-22.000.

Troup, Cathryn H., legal representative: *See*—
Troup, Edward M., deceased; Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., 4,681,259, Cl. 239-206.000.

Troup, Edward M., deceased (by Troup, Cathryn H., legal representative); Kendall, Giles A.; Han, Joseph U.; Moralez, Christopher M.; and Gongwer, Calvin A., to Anthony Manufacturing Corp. Rotary drive sprinkler. 4,681,259, Cl. 239-206.000.

Trout, Torence J.: *See*—
Larson, James R.; and Trout, Torence J., 4,681,831, Cl. 430-114.000.

Troutner, Vernon H., to McNeilab, Inc. Valve apparatus for photoactivation patient treatment system. 4,681,568, Cl. 604-250.000.

Truckner, William G.: *See*—
Kersker, Michael M.; Truckner, William G.; Granger, Douglas A.; and Rooy, Elwin L., 4,681,736, Cl. 420-535.000.

Trumper, Reinhard: *See*—
Hoffmann, Dieter; and Trumper, Reinhard, 4,681,205, Cl. 198-307.100.

Trutna, W. R.: *See*—
Goel, Atul; Bartlett, Keith G.; and Trutna, W. R., 4,681,430, Cl. 355-77.000.

TRW Cam Gears Limited: *See*—
Downing, Philip A., 4,680,981, Cl. 74-422.000.

TRW, Inc.: *See*—
Brookbank, Earl B., III, 4,681,169, Cl. 166-385.000.
Livingston, Peter M.; and Shelton, Jean C., 4,682,025, Cl. 250-201.000.

Tscherter, Hans: *See*—
Kobel, Hans; Sanglier, Jean-Jacques; Tscherter, Hans; and Bolliger, Georg, 4,681,880, Cl. 514-250.000.

Tsou, Dean T.; Blachman, Marc W.; and Burrington, James D., to Standard Oil Company, The. Method of producing adiponitrile. 4,681,968, Cl. 558-361.000.

Tsuchihashi, Masaru: *See*—
Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, 4,681,904, Cl. 523-457.000.

Tsuchiya, Yasuhiro: *See*—
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.

Tsugawa, Hiroaki: *See*—
Nomura, Masaharu; Tsugawa, Hiroaki; Ishizaka, Yukio; and Hosoi, Hiroomi, 4,682,192, Cl. 503-200.000.

Tsugita, Yasuhiro: *See*—
Okajima, Yasuhiro; Tsugita, Yasuhiro; Takechi, Tamaki; and Okada, Syuji, 4,681,623, Cl. 75-0.50B.

Tsujibayashi, Tatsuo: *See*—
Shibata, Masahiro; Tsujibayashi, Tatsuo; Sato, Hiroyuki; and Machida, Yoshinori, 4,682,245, Cl. 358-311.000.

Tsujimura, Takehisa: *See*—
Akasaki, Hidehiko; and Tsujimura, Takehisa, 4,682,207, Cl. 357-74.000.

Tsujinaka, Hisayuki: *See*—
Hohki, Tetsuo; Sano, Tetsuo; Kodama, Eiji; and Tsujinaka, Hisayuki, 4,682,040, Cl. 250-571.000.

Tsukamoto, Goro: *See*—
Satoh, Toshio; and Tsukamoto, Goro, 4,681,895, Cl. 514-535.000.

Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, to Takeda Chemical Industries, Ltd. Novel peptide and use thereof. 4,681,848, Cl. 435-240.000.

Tsunekawa, Tokuichi: *See*—
Kawabata, Takashi; Sato, Yuichi; Tsunekawa, Tokuichi; and Matsumura, Susumu, 4,681,432, Cl. 356-4.000.

Tsunewaki, Koichiro; and Ohtsuka, Ichiro, to Sumitomo Chemical Company, Limited. Hybrid seed production in common wheat using cytoplasmic male sterility. 4,680,888, Cl. 47-58.000.

Tsurumaru, Akihiko: *See*—
Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, 4,682,072, Cl. 313-115.000.

Tsuruta, Matsuhisa, to Aisin Seiki Kabushiki Kaisha. Disc brake assembly with parking brake mechanism. 4,681,194, Cl. 188-71.900.

Tsushima, Takuya: *See*—
Hirota, Akira; and Tsushima, Takuya, 4,682,251, Cl. 360-33.100.

Tsuya, Noboru; and Arai, Kenichi, to Tsuya, Noboru. Thin ribbon of semiconductor material. 4,682,206, Cl. 357-59.000.

Tuckerman, David B., to United States of America, Energy. Planarization of metal films for multilevel interconnects. 4,681,795, Cl. 428-209.000.

Tung-Chow, Siu, to Tai Cheong Blinds Company Ltd. Window blinds for vehicles. 4,681,149, Cl. 160-134.000.

Tung, Hsueh S.; Friedland, David J.; Sukornick, Bernard; McCurry, Lynn E.; Eibeck, Richard E.; and Lockyer, George D., to Allied Corporation. Lithium/fluorinated carbon battery with no voltage delay. 4,681,823, Cl. 429-218.000.

Turban, Karlheinz: *See*—
Rademachers, Jakob; Turban, Karlheinz; Franz, Gerhard; Fuhr, Werner; and Holle, Bernd, 4,681,637, Cl. 106-304.000.

Turner, Reginald R. Hot-water-furnace supplemental heater. 4,681,257, Cl. 237-56.000.

Tuss, John J.: *See*—
Orr, Ladd J.; and Tuss, John J., 4,680,868, Cl. 33-503.000.

Tuttle, Bruce A.: *See*—
Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., 4,681,717, Cl. 264-61.000.

Ube Chemical Industries Co., Ltd.: *See*—
Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, 4,681,863, Cl. 501-108.000.

Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, to Hitachi, Ltd. Semiconductor memory device with matched equivalent series resistances to the complementary data lines. 4,682,200, Cl. 357-41.000.

Uchida, Hiroshi: *See*—
Matsui, Isamu; Uchida, Hiroshi; Otoshima, Hiroo; Kubota, Yasuhiko; and Masai, Tetsuji, 4,681,271, Cl. 242-18.00R.

Uchida, Noriaki, to Nissan Shatai Company, Limited. Automotive air conditioning system with independent temperature control for dual air flows. 4,681,153, Cl. 165-31.000.

Uchidoi, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Light measuring device. 4,681,441, Cl. 356-222.000.

Uchikoshi, Shinichi: *See*—
Okayasu, Shinpei; Uchikoshi, Shinichi; and Nobatake, Atsuo, 4,681,591, Cl. 8-115.680.

Ueba, Yoshinobu; and Miyake, Shinichi, to Sumitomo Electric Industries, Ltd. Plastic optical fibers. 4,681,400, Cl. 350-96.340.

Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, to Yokogawa Hokushin Electric Corporation. Apparatus for measuring pressure. 4,680,970, Cl. 73-702.000.

Ueda, Yutaka; and Kiriake, Masaharu, to Murata Kikai Kabushiki Kaisha. Article selecting and conveying system. 4,681,231, Cl. 209-656.000.

Uehlinger, Werner H.; and Franek, Jozef T., to KM-Engineering AG. Method of making scroll strip blanks. 4,681,001, Cl. 83-37.000.

Uejima, Atsushi, to Fuji Photo Film Co., Ltd. Focussing error detection device for use in optical disk type recording system. 4,682,315, Cl. 369-45.000.

Uemura, Isamu; and Yamamoto, Kazumasa, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Automotive door handle container. 4,681,357, Cl. 292-336.300.

Ueno, Kouichi: *See*—
Nakahara, Yoshihiko; Muramatsu, Masao; and Ueno, Kouichi, 4,682,017, Cl. 235-492.000.

Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, to Glory Kogyo Kabushiki Kaisha. Note sorting and counting apparatus. 4,681,229, Cl. 209-534.000.

Uetani, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Signal transmission system. 4,682,342, Cl. 375-38.000.

Ugawa, Satoru; and Obuchi, Satoshi, deceased (by Obuchi, Fukashi, Ruriko Obuchi, legal representatives), to Nissan Motor Co., Ltd. Device for guiding upward and downward movement of window pane of automotive vehicle door. 4,680,892, Cl. 49-374.000.
Uhde GmbH: *See—*
Schwarz, Hans-Dieter; Pietzarka, Friedrich W.; Lichtenthaler, Werner; and Muhlhaus, Ludwig, 4,681,157, Cl. 165-145.000.
Ujiie, Seiichi: *See—*
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.
Ulriksson, Bengt A.; and Fletcher, Lawrence, to Weinschel Engineering Co., Inc. Noise suppression in an I-F substitution loop. 4,682,060, Cl. 307-543.000.
Ulug, Mehmet E., to General Electric Company. Implicit preemptive lan. 4,682,324, Cl. 370-85.000.
Ulug, Mehmet E., to General Electric Company. Method and apparatus for maintaining a dynamic logical ring in a token passing lan. 4,682,326, Cl. 370-89.000.
Umemura, Toshikazu; Masumoto, Isamu; and Iha, Yukihiro, to Mitsubishi Gas Chemical Company, Inc. Process for producing oxymethylene copolyer. 4,681,927, Cl. 528-232.000.
Umezaki, Kazunori: *See—*
Uesaka, Sadaaki; Numata, Toshio; and Umezaki, Kazunori, 4,681,229, Cl. 209-534.000.
Unidynamics Corporation: *See—*
Press, Irving D.; and Krieg, John, 4,681,349, Cl. 285-55.000.
Unisys Corp.: *See—*
Beasley, Michael W., 4,682,282, Cl. 364-200.000.
Gal, Laszlo V., 4,682,058, Cl. 307-473.000.
United Kingdom Atomic Energy Authority: *See—*
Parker, John A., 4,682,296, Cl. 364-518.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the: *See—*
Markvart, Tomas; and Willoughby, Arthur F. W., 4,681,983, Cl. 136-255.000.
United States Brass Corporation: *See—*
Hayman, Dennis J., 4,681,140, Cl. 137-597.000.
United States of America
Air Force: *See—*
Gassler, Richard D.; and Sridhar, Bettadapur N., 4,681,014, Cl. 89-1.816.
Jones, Edward J., 4,682,176, Cl. 342-175.000.
Milberger, Walter E.; Cohen, Joel R.; and Dubrowsky, Leonard, 4,682,126, Cl. 333-81.00B.
Wetzler, Dallas G.; and Conley, Ralph R., 4,681,261, Cl. 239-265.190.
Army: *See—*
Christopulos, John A., 4,681,821, Cl. 429-121.000.
Gerharz, Reinhold, 4,682,179, Cl. 343-755.000.
Paddock, Albert W., 4,681,387, Cl. 439-347.000.
Stanley, Ann E., 4,681,640, Cl. 148-1.500.
Commerce: *See—*
Huang, Peter H., 4,681,855, Cl. 436-39.000.
Stephenson, John R.; Groffen, John; and Heisterkamp, Nora, 4,681,840, Cl. 435-6.000.
Energy: *See—*
Brooks, Robert A.; Dosch, Robert G.; and Tuttle, Bruce A., 4,681,717, Cl. 264-61.000.
Cawthorne, Duane C., 4,682,238, Cl. 358-228.000.
Mirzadeh, Saed; and Lambrecht, Richard M., 4,681,727, Cl. 376-198.000.
Sharbaugh, John E., 4,681,731, Cl. 376-285.000.
Tuckerman, David B., 4,681,795, Cl. 428-209.000.
National Aeronautics and Space Administration: *See—*
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.
Gordon, Stephen S., 4,682,006, Cl. 219-124.340.
Graham, Olin L., 4,682,225, Cl. 358-133.000.
Owen, Robert B.; and Johnston, Mary H., 4,681,437, Cl. 356-129.000.
Pfiffner, Harold J., 4,682,343, Cl. 375-59.000.
Pickett, Herbert M.; and Farhoomand, Jam, 4,682,053, Cl. 307-425.000.
Unnam, Jalaiah; and Clark, Ronald K., 4,681,818, Cl. 428-607.000.
Woeller, Fritz H.; and Matsumoto, Yutaka, 4,681,142, Cl. 137-614.180.
U.S. Philips Corporation: *See—*
Aarts, Petrus J. J.; and Huber, Alois, 4,681,281, Cl. 242-200.000.
Anflo, Kjell S.; and Grabs, Jan W. I., 4,682,178, Cl. 342-202.000.
Bugg, Richard E. F., 4,682,161, Cl. 340-731.000.
Clasen, Rolf; and Scholz, Heinz, 4,681,614, Cl. 65-18.100.
Cuppen, Johannes J. M., 4,682,109, Cl. 324-309.000.
den Boef, Johannes H., 4,682,110, Cl. 324-309.000.
Dunnebacke, Joachim A., 4,682,364, Cl. 381-109.000.
Einhaus, Hermanus F., 4,682,319, Cl. 369-75.200.
Gibson, Rodney W., 4,682,117, Cl. 329-50.000.
Heerah, Atma, 4,682,227, Cl. 358-160.000.
Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., 4,682,074, Cl. 313-444.000.
Koken, Claus, 4,682,099, Cl. 324-63.000.
Ludikhuize, Adrianus W., 4,682,205, Cl. 357-53.000.
Marche, Pierre, 4,681,282, Cl. 244-3.160.
Martin, Guy N.; and Jatteau, Michel R., 4,682,033, Cl. 250-363.00R.
Nicolas, Jean-Marie, 4,680,966, Cl. 73-597.000.
Nillesen, Antonius H. H. J., 4,682,209, Cl. 358-19.000.
Perkins, Charles V., 4,681,445, Cl. 356-346.000.
Rose, Michael A.; and Renals, Martin, 4,682,030, Cl. 250-338.000.
Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, 4,682,098, Cl. 323-315.000.
Selbach, Bernd; and Vary, Peter, 4,682,361, Cl. 381-46.000.
Te Velde, Ties S.; and Van de Venne, Joannes L. M., 4,681,403, Cl. 350-334.000.
United Technologies Automotive, Inc.: *See—*
Prokop, Raymond A., 4,682,136, Cl. 335-282.000.
United Technologies Corporation: *See—*
Bue, Richard L.; and Ratchford Michael, 4,682,292, Cl. 364-424.000.
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.
Kepple, Dean A., 4,681,434, Cl. 356-45.000.
Sziklas, Edward A.; and Palma, Gary E., 4,682,339, Cl. 372-95.000.
Warner, John L., 4,681,610, Cl. 55-394.000.
Universal Foods Corporation: *See—*
Bennett, Robert B., III; and Wagner, Donald W., 4,681,769, Cl. 426-540.000.
University of California, The Regents of the: *See—*
Harrison, William H.; Arakawa, Mitsuaki; and McCarten, Barry M., 4,682,125, Cl. 333-12.000.
University of Georgia Research Foundation, Inc.: *See—*
Chu, Chung K.; and Schinazi, Raymond F., 4,681,933, Cl. 536-23.000.
University of Medicine and Dentistry of New Jersey: *See—*
Nathanson, Mark A.; Reddi, A. H.; and Sampath, T. K., 4,681,763, Cl. 424-95.000.
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Malone, Don, 4,681,332, Cl. 280-87.02R.
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Mueller, William H., 4,681,845, Cl. 435-96.000.
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Porter, William F., 4,681,613, Cl. 65-1.000.
USG Corporation: *See—*
Dozsa, Otto L., 4,681,644, Cl. 156-39.000.
USM Corporation: *See—*
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Usui, Koichi; Sato, Teiji; and Tanaka, Masanori, to Mizusawa Industrial Chemicals, Ltd. Process for preparation of synthetic crystalline zinc silicate mineral having a sauconite, willemite or hemimorphite structure. 4,681,749, Cl. 423-326.000.
USV Pharmaceutical Corporation: *See—*
Kantor, Martin L., 4,681,973, Cl. 560-33.000.
Utaka, Katsuyuki: *See—*
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,682,196, Cl. 357-30.000.
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Uya, Masaru, to Matsushita Electric Industrial Co., Ltd. Parallel binary adder. 4,682,303, Cl. 364-788.000.
Valadez, Frank R.: *See—*
Sequeira, Richard J.; and Valadez, Frank R., 4,681,136, Cl. 137-494.000.
Vallomy, John A., to Intersteel Technology, Inc. Method and apparatus for continuously charging a steelmaking furnace. 4,681,537, Cl. 432-242.000.
Valtchev, Konstantin L. Chorion biopsy instrument. 4,681,123, Cl. 128-753.000.
Van Doorne's Transmissie B. V.: *See—*
Ohgami, Masaaki, 4,680,990, Cl. 74-868.000.
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Van Antwerp, Stanley R.: *See—*
Holt, Gary E.; Siehling, Mark B.; and Van Antwerp, Stanley R., 4,682,000, Cl. 219-116.000.
Vanaschen, Luc: *See—*
Kunert, Heinz; Vanaschen, Luc; and Cornils, Gerd, 4,681,794, Cl. 428-188.000.
Vancil, David W. Adjustable headrest for sunbathers. 4,681,370, Cl. 297-405.000.
Vanderbilt University: *See—*
Godbold, Thomas M.; and Baker, William R., 4,681,598, Cl. 44-1.0SR.
Van de Venne, Joannes L. M.: *See—*
Te Velde, Ties S.; and Van de Venne, Joannes L. M., 4,681,403, Cl. 350-334.000.

VanDusen, Morris V.: *See—*
Cotzas, George M.; VanDusen, Morris V.; and VanSchaick, Thomas E., 4,682,068, Cl. 310-198.000.

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Bocking, Bruce; Cervantes, Joe A., Jr.; Green, Douglas H.; La Sota, Bruce W.; Marshall, David H.; Rodriguez, Bernard; and Van Gorden, Glen, 4,681,175, Cl. 175-393.000.

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Hoeberechts, Arthur M. E.; and van Gorkom, Gerardus G. P., 4,682,074, Cl. 313-444.000.

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Van Patten, Frederic D. Viewing instrument for chimney. 4,681,086, Cl. 126-120.000.

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Cotzas, George M.; VanDusen, Morris V.; and VanSchaick, Thomas E., 4,682,068, Cl. 310-198.000.

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Wells, Gregory J., 4,682,027, Cl. 250-291.000.

Vary, Peter: *See—*
Selbach, Bernd; and Vary, Peter, 4,682,361, Cl. 381-46.000.

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Giuliani, Giovanni, 4,681,138, Cl. 137-516.290.

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Sanders, Robert E.; Flynn, Charles J.; and Vertreese, John L., 4,682,079, Cl. 315-186.000.

Verzilli, Giovanni: *See—*
Lodispoto, Alberto, 4,681,114, Cl. 128-581.000.

Vesely, Edward J.: *See—*
Harringer, Robert V.; Rada, Robert O.; and Vesely, Edward J., 4,681,208, Cl. 198-341.000.

Vibro-Meter SA: *See—*
Lustenberger, Martin, 4,680,976, Cl. 73-862.330.

Vickers Systems GmbH: *See—*
Schulz, Rene ; Teubler, Heinz; and Breuer, Peter, 4,681,517, Cl. 417-300.000.

Victor Company of Japan, Ltd.: *See—*
Ayabe, Yasuhiro, 4,682,256, Cl. 360-119.000.
Hirota, Akira, 4,682,250, Cl. 360-33.100.
Hirota, Akira; and Tsushima, Takuya, 4,682,251, Cl. 360-33.100.
Ikemura, Yuichi; and Takano, Hiroshi, 4,682,210, Cl. 358-29.000.

Victory Engineering Corp.: *See—*
Winters, Arthur; and Molee, Casper S., 4,681,122, Cl. 128-736.000.

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Ippolito, Robert M.; and Vigmond, Stephen, 4,681,944, Cl. 546-340.000.

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Vincent, Harold L.: *See—*
Broderick, Dennis W.; and Vincent, Harold L., 4,681,908, Cl. 524-268.000.

Voest-Alpine Automotive m.b.H.: *See—*
Schmidt, Karl-Heinz; and Seibt, Artur, 4,682,090, Cl. 318-661.000.

Vogel, Hans-Henning, to BASF Aktiengesellschaft. Production of compression moldings from finely divided thermoplastic polymers. 4,681,719, Cl. 264-122.000.

Volk, Stanley: *See—*
Hirsch, Gerald B.; Volk, Stanley; Cirrito, William; and Brann, Dale, 4,680,815, Cl. 2-171.300.

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Pinto, Gideon; and Schanin, Jonathan, 4,681,646, Cl. 156-157.000.

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Vora, Rohitkumar H.: *See—*
Berger, Abe; and Vora, Rohitkumar H., 4,681,928, Cl. 528-353.000.

W. Haking Enterprises Limited: *See—*
Raschke, Klaus, 4,681,416, Cl. 354-173.100.

W. R. Grace & Co.: *See—*
Edwards, Grant C.; Gilson, Jean-Pierre; and McDaniel, Carl V., 4,681,864, Cl. 502-63.000.

W. Schlafhorst & Co.: *See—*
Kupper, Wilhelm, 4,681,230, Cl. 209-615.000.

Wachter, Michael P.: *See—*
Murray, William V.; and Wachter, Michael P., 4,681,894, Cl. 514-507.000.

Wada, Yukio: *See—*
Fukushima, Shoji; Kato, Motosaburo; Mochizuki, Takashi; and Wada, Yukio, 4,681,645, Cl. 156-73.100.

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Wadsworth, Harry J.: *See—*
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,681,966, Cl. 558-255.000.

WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft: *See—*
Lange, Gerhard, 4,680,926, Cl. 59-27.000.

Wagner, Bernd: *See—*
Kleinschroth, Jorgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,881, Cl. 514-258.000.
Kleinschroth, Jurgen; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; and Wagner, Bernd, 4,681,885, Cl. 514-258.000.

Wagner, Dietmar, to International Business Machines Corporation. Method for surface testing. 4,681,442, Cl. 356-237.000.

Wagner, Donald W.: *See—*
Bennett, Robert B., III; and Wagner, Donald W., 4,681,769, Cl. 426-540.000.

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Wagner, Richard H.; and Wagner, George J., 4,681,479, Cl. 404-6.000.

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Wagner, Rudolf: *See—*
Groll, Werner; Schock, Gernot; Hathaway, Doris; and Wagner, Rudolf, 4,681,735, Cl. 420-464.000.

Wagner, Theodore W.: *See—*
Minch, Morris L.; and Wagner, Theodore W., 4,682,356, Cl. 379-347.000.

Wahling, Werner; and Ziegler, Gunther, to SGF Suddeutsche Gelenkscheibenfabrik GmbH & Co. KG. Torsional vibration damper. 4,680,984, Cl. 74-574.000.

Wainwright, H. Kent, to In-Situ, Inc. Solvent detector. 4,682,156, Cl. 340-603.000.

Wakabayashi, Yoh'ichi: *See—*
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, 4,681,633, Cl. 106-35.000.

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Wakimasu, Mitsuhiro: *See—*
Tsukamoto, Kyozo; Ichimori, Yuzo; and Wakimasu, Mitsuhiro, 4,681,848, Cl. 435-240.000.

Wakui, Yukio: *See—*
Takahashi, Toshiro; Tokushima, Tadao; Suzuki, Yoshifumi; and Wakui, Yukio, 4,681,669, Cl. 204-35.100.

Waldecker, Ralf: *See—*
Hofmann, Manfred; Muller, Hans; and Waldecker, Ralf, 4,681,306, Cl. 267-140.100.

Waldner, Kurt. Apparatus and method for forming die-cut articles from sheet material. 4,681,004, Cl. 83-98.000.

Walker, Donald R.: *See—*
Mitchell, Hal D.; and Walker, Donald R., 4,680,814, Cl. 2-2.000.

Walker, Jerry L.; and Zupanovich, John D., to Calgon Corporation. Stabilized sodium erythorbate boiler corrosion inhibitor compositions and methods. 4,681,737, Cl. 422-16.000.

Walker, William J.: *See—*
Faiz, Robert L.; Walker, William J.; Ramey, Philip; Adams, Kenneth M.; Flonc, Nicholas P.; and Nguyen, Dean, 4,681,724, Cl. 264-257.000.

Wallentowitz, Henning: *See—*
Hoernig, Rudolf; Herges, Peter; Knoff, Bernd; Richter, Karl-Heinz; Buechle, Karl-Heinz; and Wallentowitz, Henning, 4,681,185, Cl. 180-247.000.

Walsh, Edward: *See—*
Sleger, Roger R.; and Walsh, Edward, 4,682,255, Cl. 360-106.000.

Walter, Richard T.: *See—*
Abbratozzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., 4,682,066, Cl. 310-154.000.

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Wang, Wen-Ching. Light-detector, hand-controlled faucet with water temperature regulator. 4,681,141, Cl. 137-607.000.

Wangler, Jan: *See—*
Sykora, Jan; and Wangler, Jan, 4,680,989, Cl. 74-867.000.

Wareham, William, to Dynisco, Inc. Pressure transducer. 4,680,972, Cl. 73-730.000.

Wargo, Robert A., to RCA Corporation. Magnitude independent hanging dot detector. 4,682,213, Cl. 358-31.000.

Warner, John L., to United Technologies Corporation. High performance water collector. 4,681,610, Cl. 55-394.000.

Warner-Lambert Company: *See*—
Chaudhari, Atma; and Lee, Joseph K. S., 4,681,858, Cl. 436-165.000.
Huzinec, Robert J.; and Graff, Allan H., 4,681,766, Cl. 426-5.000.
Kaltenbronn, James S.; and Stier, Michael A., 4,681,972, Cl. 560-29.000.
McNamara, Dennis J.; and Cook, Phillip D., 4,681,873, Cl. 514-50.000.
Roth, Bruce D., 4,681,893, Cl. 514-422.000.
Warner & Swasey Company, The: *See*—
Orr, Ladd J.; and Tuss, John J., 4,680,868, Cl. 33-503.000.
Warwick, David R. Window grill latch. 4,681,354, Cl. 292-37.000.
Washburn, William J., to Aerojet-General Corporation. Ammunition cartridge case. 4,681,038, Cl. 102-464.000.
Wassenaar, Roelof F.: *See*—
Seevinck, Evert; Wassenaar, Roelof F.; and Holle, Eerke, 4,682,098, Cl. 323-315.000.
Watabe, Shin, to Mitsubishi Jukogyo Kabushiki Kaisha. Operation mode controller. 4,682,279, Cl. 364-141.000.
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; Mitsudoh, Makoto; and Wakabayashi, Yoh'ichi, to Kyushu Refractories Co., Ltd. High strength calcium phosphate glass-ceramic materials. 4,681,633, Cl. 106-35.000.
Watanabe, Kenichi, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Control system for automatic electronic-part mounter. 4,681,452, Cl. 356-375.000.
Watanabe, Yoshio: *See*—
Ogawa, Soichiro; and Watanabe, Yoshio, 4,682,080, Cl. 315-209.00R.
Watanabe, Yuji, to Sony Corporation. Very large video display apparatus which can be constructed of a number of modular units. 4,682,239, Cl. 358-241.000.
Watarai, Syu: *See*—
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, 4,681,832, Cl. 430-115.000.
Waterloo Industries, Inc.: *See*—
Sevey, Douglas, 4,681,381, Cl. 312-333.000.
Waterman, James W.: *See*—
Mason, Ronald G.; Pitzer, Emory W.; McDaniel, Max P.; Rogers, David L.; and Waterman, James W., 4,681,266, Cl. 241-18.000.
Watson, Jesse E., Jr. Identification tag. 4,680,882, Cl. 40-5.000.
Watts, Ralph E.: *See*—
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
Waybright, George C.: *See*—
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.
Wean United Rolling Mills, Inc.: *See*—
Ginzburg, Vladimir B.; and Jones, G. Brian, 4,680,978, Cl. 73-862.070.
Webasto-Werk W. Baier GmbH & Co.: *See*—
Bienert, Horst; and Kohlpaintner, Georg, 4,681,364, Cl. 296-217.000.
Weber, Hans-Ulrich: *See*—
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.
Weber, Klaus-Dieter: *See*—
Michalak, Stanislaw; Weber, Klaus-Dieter; and Meier, Jurgen, 4,681,746, Cl. 423-239.000.
Weber-Unger, Georg: *See*—
Eberl, Tertulin; and Weber-Unger, Georg, 4,681,587, Cl. 623-7.000.
Webster, Owen W., to Du Pont de Nemours, E. I., and Company. "Living" polymers and process for their preparation. 4,681,918, Cl. 525-282.000.
Weigl, Adolf. Armor for protecting body regions. 4,680,812, Cl. 2-2.000.
Weigle, Dieter: *See*—
Griese, Klaus; Mayer, Siegfried; and Weigle, Dieter, 4,681,514, Cl. 417-213.000.
Weinberger, Zvi. Anti-theft system for motor vehicles. 4,682,062, Cl. 307-10.0AT.
Weinheimer, Gonter: *See*—
Kleinschroth, Jorgen; Satzinger, Gerhard; Mannhardt, Karl; Hartenstein, Johannes; Osswald, Hartmut; Weinheimer, Gonter; and Fritschi, Edgar, 4,681,882, Cl. 514-258.000.
Weinschel Engineering Co., Inc.: *See*—
Ulriksson, Bengt A.; and Fletcher, Lawrence, 4,682,060, Cl. 307-543.000.
Weinshenker, Eugene: *See*—
Linman, E. Kelly; Curro, John J.; and Weinshenker, Eugene, 4,681,793, Cl. 428-138.000.
Weiss, Manfred, to Henkell & Co. Method for decreasing the alcohol content of alcohol-containing beverages, particularly wine and sparkling wine. 4,681,767, Cl. 426-14.000.
Weiss, Peter: *See*—
Thievessen, Karl; and Weiss, Peter, 4,681,274, Cl. 242-58.300.
Weitman, Jacob. Heat recovery device. 4,681,744, Cl. 422-173.000.
Weitmann, Heinz; and Keller, Alfred, to Weitmann & Konrad GmbH & Co. KG. Process for continuous density measurement. 4,680,965, Cl. 73-445.000.
Weitmann & Konrad GmbH & Co. KG: *See*—
Weitmann, Heinz; and Keller, Alfred, 4,680,965, Cl. 73-445.000.
Welch, James A., Sr. Storage and inventory control system for keys. 4,681,504, Cl. 414-268.000.
Weldmatic Patents, Inc.: *See*—
Kosch, Delmar D., 4,681,277, Cl. 242-156.200.
Well Improvement Specialists, Inc.: *See*—
Guidry, John P.; and Gavranovic, Lee Roy C., 4,681,163, Cl. 166-278.000.
Wells, Gregory J., to Varian Associates, Inc. Method and apparatus for sample confirmation in gas chromatography. 4,682,027, Cl. 250-291.000.
Wendel, Armin: *See*—
Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,681,617, Cl. 71-86.000.
Werner, Jean J., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Echo canceller. 4,682,358, Cl. 379-411.000.
Werner, Margrit: *See*—
Beck, Walter; Berger, Siegfried; and Werner, Margrit, 4,681,562, Cl. 604-54.000.
Wertz, Ronald D., to Ball Corporation. Method and apparatus for stabilizing angle of acceptance of multiple-beam interferometer means in optical measuring system. 4,681,448, Cl. 356-352.000.
Westinghouse Electric Corp.: *See*—
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
Veronesi, Luciano; Obermeyer, Franklin D.; and Chrise, James R., 4,681,728, Cl. 376-209.000.
Weston, Harry, to Hydril Company. Rotatable ball valve apparatus and method. 4,681,133, Cl. 137-315.000.
Westphalen, Jurgen: *See*—
Wadephul, Jost; and Westphalen, Jurgen, 4,680,900, Cl. 51-430.000.
Wetzler, Dallas G.; and Conley, Ralph R., to United States of America, Air Force. Heat resistant short nozzle. 4,681,261, Cl. 239-265.190.
Wheeler, Dale K.: *See*—
Abbratozzato, Salvatore R.; Walter, Richard T.; and Wheeler, Dale K., 4,682,066, Cl. 310-154.000.
White Castle System, Inc.: *See*—
Brabb, James D.; and Simpson, Dennis L., 4,681,265, Cl. 239-665.000.
White Consolidated Industries, Inc.: *See*—
Mawby, Harold S.; and Harris, Duane H., 4,680,943, Cl. 62-300.000.
Rummel, Raymond W.; and Crystal, Anthony A., 4,680,948, Cl. 68-3.00R.
White, Harold R.; and Doncer, Alex J., to Alar Engineering Corporation. Air flotation clarifier. 4,681,682, Cl. 210-221.200.
White, Larry; and Ingels, Luis. Pressure-sensing toothbrush holder. 4,680,825, Cl. 15-105.000.
White, William T.: *See*—
Daniels, Julia G.; Ledbetter, Frank E., III; Clemons, Johnny M.; Penn, Benjamin G.; and White, William T., 4,680,897, Cl. 51-281.00R.
Whitehead, Graham K.; and Taylor, Kenneth, to British Telecommunications public limited company. Integrated circuit chip carrier. 4,682,270, Cl. 361-401.000.
Whitesides, Michael G.: *See*—
Hardy, Kenneth J.; and Whitesides, Michael G., 4,681,853, Cl. 435-288.000.
Whitten, Charles E.; and Pews, R. Garth, to Dow Chemical Company, The. 1-acyl-1-(2-pyridinyl)semicarbazides. 4,681,943, Cl. 546-306.000.
Wiberg, Olle, to Esselte Almanacksforlag AB. Arrangement for holding and filing documents, papers and the like. 4,681,474, Cl. 402-75.000.
Widhopf, Martin, to Anton Steinecker Maschinenfabrik GmbH. Boiler for boiling mash or wort. 4,681,066, Cl. 122-234.000.
Wiedeck, Hans-Norbert: *See*—
Arciszewski, Bernhard; and Wiedeck, Hans-Norbert, 4,681,482, Cl. 404-35.000.
Wiedermann, Rolf: *See*—
Haas, Peter; Weber, Hans-Ulrich; Sommerfeld, Claus-Dieter; Giersig, Manfred; and Wiedermann, Rolf, 4,681,903, Cl. 521-167.000.
Wiegers, Wilhelmus J.: *See*—
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,681,976, Cl. 560-126.000.
Wieland, Dieter; Aly, Abou; and Riess, Hartmut, to Andreas Stihl. Motor-driven chain saw. 4,680,862, Cl. 30-381.000.
Wiktor, Dominik M. Catheter arrangement having a blood vessel liner, and method of using it. 4,681,110, Cl. 128-343.000.
Wilhelm Hegenscheidt GmbH: *See*—
Feldewert, Herbert, 4,680,846, Cl. 29-168.000.
Wilke, Richard; and Korthaus, Helmut. Circulating-ball drive. 4,680,982, Cl. 74-424.80R.
Wilkinson, Trevor A. Multidirectionally adjustable vibrato device. 4,681,010, Cl. 84-298.000.
Will, Fritz G.: *See*—
Niedrach, Leonard W.; and Will, Fritz G., 4,681,673, Cl. 204-415.000.
Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine and method for controlling the motion of a workholder. 4,681,048, Cl. 112-262.300.
Willenbacher, Erich: *See*—
Kirch, Otto; and Willenbacher, Erich, 4,681,051, Cl. 112-306.000.
Wm. C. Staley Machinery Corporation: *See*—
Sardella, Louis M., 4,681,311, Cl. 271-11.000.
William F. Cosulich Associates, P.C.: *See*—
Dvirka, Miro; Psihos, George J.; and Cosulich, Joseph J., 4,681,045, Cl. 110-345.000.

Williams, Edward L., to Becton, Dickinson and Company. Moisture-controlled glass microscope slide package. 4,681,218, Cl. 206-204.000.
Williams, John; and Robson, Michael J., to Imperial Chemical Industries PLC. Process for the preparation of an enantiomeric pair of isomers of cyfluthrin. 4,681,969, Cl. 558-407.000.
Williams, Richard D. Construction material. 4,680,907, Cl. 52-309.170.
Williams, Tim A., to Motorola, Inc. Logarithmic arithmetic logic unit. 4,682,302, Cl. 364-768.000.
Willis, Donald H.: *See*—
Haferl, Peter E.; Sutherland, Hugh F., II; Luz, David W.; McDonald, James A.; Waybright, George C.; and Willis, Donald H., 4,682,085, Cl. 315-371.000.
Willoughby, Arthur F. W.: *See*—
Markvart, Tomas; and Willoughby, Arthur F. W., 4,681,983, Cl. 136-255.000.
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., to Merck & Co., Inc. Process for the preparation of difficidin and derivative antibacterials. 4,681,846, Cl. 435-124.000.
Wilson, Larry L.: *See*—
Deckert, Clinton; and Wilson, Larry L., 4,681,563, Cl. 604-67.000.
Wilson, William G. Methods for simultaneously desulfurizing and degassing steels. 4,681,625, Cl. 75-53.000.
Winiasz, Michael E., to Harris Graphics Corporation. Gripper assembly. 4,681,213, Cl. 198-803.900.
Winn, Michael L.: *See*—
Wang, Samuel C.; Swab, John M.; Winn, Michael L.; and Gibbons, Martin D., 4,682,236, Cl. 358-213.260.
Winston, Steven J.: *See*—
Mallory, Charles W.; Watts, Ralph E.; Paladino, Joseph B.; Razor, John E.; Lilley, Arthur W.; Winston, Steven J.; and Stricklin, Billy C., 4,681,706, Cl. 252-633.000.
Winters, Arthur; and Molee, Casper S., to Victory Engineering Corp. Stereotaxic catheter for microwave thermotherapy. 4,681,122, Cl. 128-736.000.
Wirth, Axel: *See*—
Stetter, Eckart; Reichenberger, Helmut; Schneider, Siegfried; and Wirth, Axel, 4,682,108, Cl. 324-309.000.
Wisecup, David R., to Monarch Marking Systems, Inc. One-piece plastics fastener. 4,680,836, Cl. 24-150.0FP.
Wisnieswski, Mark S. Wrench rack. 4,681,234, Cl. 211-70.600.
Wissing, William K.: *See*—
Nelson, Jordan R.; and Wissing, William K., 4,682,075, Cl. 313-466.000.
Witcombe, John D. Mixer. 4,681,456, Cl. 366-46.000.
Withers, Howard P.: *See*—
Dyer, Paul N.; Pierantozzi, Ronald; and Withers, Howard P., 4,681,867, Cl. 502-242.000.
Wittmann, Heinz: *See*—
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Woell, James B.: *See*—
Alper, Howard; Despeyroux, Bertrand; Smith, David J. H.; and Woell, James B., 4,681,707, Cl. 260-410.90R.
Woeller, Fritz H.; and Matsumoto, Yutaka, to United States of America, National Aeronautics and Space Administration. Self-compensating solenoid valve. 4,681,142, Cl. 137-614.180.
Woffinden, Gary A.; and Hanson, Donald L., to Amdahl Corporation. Data storage unit employing translation lookaside buffer pointer. 4,682,281, Cl. 364-200.000.
Wolaver, Dan H.; and Little, Warren E., to General Signal Corporation. High speed phase locked loop filter circuit. 4,682,116, Cl. 328-167.000.
Wolf, Kurt; and Andre, Wolfram K., to Kurt Wolf & Co. KG. Apparatus for controlling and adjusting heat output during the heating phase of a cooking vessel. 4,682,012, Cl. 219-490.000.
Wolf, Kurt: *See*—
Andre, Wolfram K.; and Wolf, Kurt, 4,682,013, Cl. 219-497.000.
Wolf, Reinhard: *See*—
Steckhan, Eberhard; Wolf, Reinhard; and Puetter, Hermann, 4,681,977, Cl. 560-262.000.
Wolfe, Larry L.: *See*—
Kantor, Sherwood; Selby, Garry J.; and Wolfe, Larry L., 4,681,424, Cl. 355-14.00R.
Wolters, Karen A. Food preparation process. 4,681,000, Cl. 83-862.000.
Wood, Prentice J.: *See*—
Doerr, Erwin; and Wood, Prentice J., 4,681,252, Cl. 229-52.00B.
Wood, Ronald E.: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,681,499, Cl. 411-507.000.
Woods, Randall L. Intraocular lens having unitary integral haptic means. 4,681,586, Cl. 623-6.000.
Worley, Shelby D., to PPG Industries, Inc. N,N'dihalo-2-imidazolidinones. 4,681,948, Cl. 548-319.000.
Worschischek, Rainer-Karl: *See*—
Landgraf, Hermann; Schuss, Werner; and Worschischek, Rainer-Karl, 4,681,540, Cl. 433-126.000.
Wu, Muyen M.; Li, George S.; and Dewitt, Elmer J., to Standard Oil Company, The. Poly (vinyl chloride) compositions. 4,681,916, Cl. 525-210.000.
Wu, Muyen M.: *See*—
Li, George S.; Wu, Muyen M.; and Dewitt, Elmer J., 4,681,917, Cl. 525-210.000.
Wuerthner, Hubert: *See*—
Himmetsberger, Alois; Pavlovec, Radko; Wittmann, Heinz; Wuerthner, Hubert; Szasz, Tibor; Liedl, Kurt; and Erdei, Roland, 4,681,339, Cl. 280-633.000.
Wyant, James A. Towelling package. 4,681,240, Cl. 221-48.000.
Wyckoff, Charles W. Sheet material marker surface for roadways and the like. 4,681,401, Cl. 350-105.000.
Xerkon Company: *See*—
Vees, Frederick; and Drummond, Todd, 4,681,049, Cl. 112-262.300.
Xerox Corporation: *See*—
Bean, Lloyd F.; Forbes, Richard L., II; Swift, Joseph A.; and Thorp, Bruce E., 4,681,426, Cl. 355-15.000.
Cooper, Thomas F., 4,681,310, Cl. 270-53.000.
Elchinger, Gilbert M.; Mutschler, Edward C., Jr.; and Behun, Eugene, 4,682,183, Cl. 346-75.000.
Gabor, Andrew, 4,681,469, Cl. 400-157.200.
Grushkin, Bernard, 4,681,829, Cl. 430-109.000.
Harvey, Raymond A., 4,681,312, Cl. 271-207.000.
Ya-man Ltd.: *See*—
Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, 4,682,221, Cl. 358-107.000.
Yabe, Hideo: *See*—
Suzuki, Yoshio; Sonoda, Hirotetu; and Yabe, Hideo, 4,681,184, Cl. 180-141.000.
Yabe, Kiyoshi: *See*—
Kondo, Tadashi; and Yabe, Kiyoshi, 4,681,993, Cl. 200-153.0SC.
Yagi, Isaburo: *See*—
Hyodo, Masakatsu; and Yagi, Isaburo, 4,681,783, Cl. 428-36.000.
Yagi, Kenji: *See*—
Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.
Yamada, Akira; and Tokura, Go, to Canon Kabushiki Kaisha. Double-face flexible printed circuit board. 4,681,421, Cl. 354-485.000.
Yamada, Hirohide; Sakakibara, Masahiko; and Koike, Yoshiharu, to Hitachi Metals, Ltd. Ceramic substrate for a thin layer magnetic head. 4,681,813, Cl. 428-450.000.
Yamada, Kazuhiko, to Kabushiki Kaisha Toshiba. Printed circuit board and method for fabrication thereof. 4,682,271, Cl. 361-409.000.
Yamada, Kazumori: *See*—
Ichikawa, Yoshio; and Yamada, Kazumori, 4,682,148, Cl. 340-311.100.
Yamada, Koji: *See*—
Ooka, Akihiro; Okamoto, Kenji; and Yamada, Koji, 4,680,818, Cl. 5-81.00R.
Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. System for supervising photomechanical process. 4,682,286, Cl. 364-200.000.
Yamada, Toshitaka: *See*—
Sato, Yoshihisa; Kinugawa, Masumi; Akiyama, Susumu; Yamada, Toshitaka; Mizuno, Tiaki; Suzuki, Atsushi; and Sugiura, Kengo, 4,680,964, Cl. 73-204.000.
Yamagata, Shimbu: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; Yamagata, Shimbu; Kubo, Yutaka; and Mizuno, Hirotaka, 4,682,300, Cl. 364-571.000.
Yamagishi, Hideshi: *See*—
Wakayama, Naoaki; Yamagishi, Hideshi; Fukakusa, Shinji; and Tomoda, Toshimasa, 4,682,036, Cl. 250-374.000.
Yamaguchi, Shunzo: *See*—
Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.
Yamaguchi, Yasuyoshi: *See*—
Oba, Harutaro; Ozawa, Yasuhiko; Yamaguchi, Yasuyoshi; and Mimoto, Osamu, 4,681,422, Cl. 355-3.00R.
Yamaguchi, Yoshito: *See*—
Nakamura, Norihiko; Morishima, Hideki; and Yamaguchi, Yoshito, 4,681,465, Cl. 368-246.000.
Yamahara, Tohji: *See*—
Kanehira, Koichi; Shiono, Manzo; Fujita, Yoshiji; Nishida, Takashi; and Yamahara, Tohji, 4,681,890, Cl. 514-333.000.
Yamakawa, Tsuyoshi, to Teijin Seiki Company Limited. Elastic support members for an electric actuator. 4,682,135, Cl. 335-256.000.
Yamakawa, Yoshifumi, to Sony Corporation. Brightness and contrast adjusting apparatus. 4,682,231, Cl. 358-168.000.
Yamamoto, Kazumasa: *See*—
Uemura, Isamu; and Yamamoto, Kazumasa, 4,681,357, Cl. 292-336.300.
Yamamoto, Kosei; Kaneyasu, Akira; and Arita, Yo, to Ube Chemical Industries Co., Ltd. High-density magnesia-calcia clinker and process for production thereof. 4,681,863, Cl. 501-108.000.
Yamamoto, Shukou: *See*—
Ohashi, Toshio; and Yamamoto, Shukou, 4,682,208, Cl. 357-81.000.
Yamamoto, Takashi: *See*—
Kondo, Katsumi; Tsuchiya, Yasuhiro; Niimi, Takatsune; Yamamoto, Takashi; and Matsuba, Kunihiro, 4,681,647, Cl. 156-172.000.
Yamamoto, Yuichi, to Terumo Kabushiki Kaisha. Drug administering apparatus. 4,681,582, Cl. 604-890.000.
Yamana, Masayuki: *See*—
Hisamoto, Iwao; and Yamana, Masayuki, 4,681,974, Cl. 560-87.000.
Yamanaka, Teruo; Sugimoto, Takao; and Hayakawa, Kizo. Microwave and luminous probe. 4,680,960, Cl. 73-117.300.
Yamanaka, Yukio: *See*—
Ichihara, Takeo; Yamanaka, Yukio; and Tsurumaru, Akihiko, 4,682,072, Cl. 313-115.000.

Yamane, Norihito: *See*—
Nagata, Kunio; Aoi, Tatsuo; Iwakiri, Norio; Osumi, Hiroshi; Ogata, Nobuyuki; and Yamane, Norihito, 4,681,994, Cl. 200-16.00B.

Yamato, Akihiro; Koike, Yuzuru; and Futa, Kyozo, to Honda Giken Kogyo Kabushiki Kaisha. Idling speed feedback control method for internal combustion engines. 4,681,075, Cl. 123-339.000.

Yamauchi, Takashi; Hayashi, Shoichiro; and Sasakawa, Atsushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing 2,6-naphthalenedicarboxylic acid. 4,681,978, Cl. 562-413.000.

Yamazaki, Daisuke: *See*—
Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

Yamazaki, Iwao; Nakamichi, Yuji; Abe, Keizo; and Okudera, Tatsuya, to Ya-man Ltd. Non-contact electro-optical displacement follower. 4,682,221, Cl. 358-107.000.

Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, to Semiconductor Energy Laboratory Co., Ltd. Electronic device manufacturing methods. 4,680,855, Cl. 29-583.000.

Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,681,980, Cl. 585-6.300.

Yanagita, Makoto: *See*—
Kanda, Shoichi; Yanagita, Makoto; and Sekimoto, Yukihiko, 4,681,690, Cl. 252-8.551.

Yang, Tai-Her. Dumbbell with double cover hand protector and grasping training function. 4,681,315, Cl. 272-122.000.

Yano, Hideaki: *See*—
Tateoka, Masamichi; and Yano, Hideaki, 4,682,316, Cl. 369-46.000.

Yano, Naomichi; Ito, Hajime; and Tanaka, Shigeru, to Kubota, Ltd. Heat accumulating material enclosing container and heat accumulating apparatus. 4,681,154, Cl. 165-47.000.

Yasuda, Kazuo; Ando, Toshiharu; Itabashi, Yoshifumi; and Tsuchihashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Epoxy resin composition. 4,681,904, Cl. 523-457.000.

Yasuda, Shigekazu: *See*—
Kubota, Kazuhisa; and Yasuda, Shigekazu, 4,681,435, Cl. 356-71.000.

Yasunobu, Isamu: *See*—
Shibata, Nobuho; Yasunobu, Isamu; Neki, Shigeo; Ohara, Kenichi; and Dohi, Takashi, 4,682,095, Cl. 318-778.000.

Yatsuo, Tsutomu; Momma, Naohiro; Naito, Masayoshi; and Okamura, Masahiro, to Hitachi, Ltd. High voltage thyristor with optimized doping, thickness, and sheet resistivity for cathode base layer. 4,682,199, Cl. 357-38.000.

Yazaki, Yoshio, to ORC Manufacturing Co., Ltd. Movable light source type exposure apparatus. 4,682,277, Cl. 362-296.000.

Yazawa, Yoshiaki: *See*—
Uchida, Hideaki; Mitsumoto, Kinya; Yazawa, Yoshiaki; Nakazato, Shinji; and Odaka, Masanori, 4,682,200, Cl. 357-41.000.

Yeh, Pochi A., to Rockwell International Corporation. Phase conjugate fiber gyroscope. 4,681,446, Cl. 356-350.000.

Yilmaz, Hamza, to General Electric Company. Insulated gate device with configured emitter contact pad. 4,682,195, Cl. 357-23.400.

Yokogawa Hokushin Electric Corporation: *See*—
Kobayashi, Tamotsu; Goto, Shigeru; Ohta, Hironobu; and Torimaru, Takashi, 4,680,973, Cl. 73-861.160.
Ueda, Toshitsugu; Kohsaka, Fusao; Yamazaki, Daisuke; and Akazawa, Hideo, 4,680,970, Cl. 73-702.000.

Yokokawa, Harumi: *See*—
Fujishige, Masao; Yokokawa, Harumi; Ujiie, Seiichi; and Dokiya, Masayuki, 4,681,626, Cl. 75-68.00A.

Yokota, Hideo: *See*—
Kato, Masatake; Nishimura, Tetsuharu; and Yokota, Hideo, 4,682,237, Cl. 358-225.000.

Yokovama, Yasuyuki; Nakamura, Kiyoaki; Goi, Hiroshi; and Fujioka, Koichiro, to Iwatsu Electric Co., Ltd. Photosensitive paper conveying device of a copying machine. 4,681,313, Cl. 271-273.000.

Yokoya, Hiroaki: *See*—
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Kitatani, Katuzi, 4,681,832, Cl. 430-115.000.

Yokoya, Yuji: *See*—
Sato, Hiroki; Sanada, Yukitomo; Yokoya, Yuji; Masaki, Kazuo; Nakagawa, Kiyohara; and Murata, Syuuji, 4,681,143, Cl. 137-625.370.

Yoneda, Toshikazu: *See*—
Katsuno, Hisashi; Murakawa, Takashi; and Yoneda, Toshikazu, 4,681,865, Cl. 502-74.000.

York, Norman N. Apparatus for removing tree stumps. 4,681,145, Cl. 144-2.00N.

Yoshida, Hajime, to Hajime Industries Ltd. Bottle sidewall defect detector employing masking means. 4,682,023, Cl. 250-223.00B.

Yoshida, Ichirou: *See*—
Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; Yoshida, Ichirou; and Atsumi, Morihiro, 4,681,989, Cl. 200-19.00R.

Yoshida, Kazunori: *See*—
Egami, Tsuneyuki; Saito, Tsutomu; Ando, Mitosi; Hori, Ryuzou; Kamo, Takashi; and Yoshida, Kazunori, 4,682,041, Cl. 250-571.000.

Yoshida, Shohei: *See*—
Usami, Toshimasa; Tanaka, Toshiharu; and Yoshida, Shohei, 4,682,194, Cl. 503-215.000.

Yoshida, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Light-electricity conversion semiconductor device. 4,681,982, Cl. 136-249.000.

Yoshikumi, Chikao: *See*—
Muto, Shigeaki; Ando, Takao; Fujii, Takayoshi; Kanno, Akihiko; Onishi, Yoko; Motokawa, Isamu; Furusho, Takao; and Yoshikumi, Chikao, 4,681,877, Cl. 514-206.000.

Yoshimura, Masaaki: *See*—
Ohta, Koji; Yoshimura, Masaaki; and Takahashi, Mizunori, 4,681,909, Cl. 524-272.000.

Yoshimura, Yoshinari: *See*—
Teramae, Hiroshi; and Yoshimura, Yoshinari, 4,681,201, Cl. 192-106.200.

Yoshino, Hirobumi: *See*—
Ito, Masaji; Midorikawa, Akira; Shinada, Masayuki; Hirono, Tatsuo; Yoshino, Hirobumi; and Shibusawa, Mitsuo, 4,682,158, Cl. 340-679.000.

Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Automatically fastening seatbelt assembly. 4,681,346, Cl. 280-804.000.

Young, Colin G. Automatic fuel tank anti B.L.E.V.E. safety apparatus and system. 4,680,937, Cl. 62-54.000.

Young, Peter L., to Optical Materials, Inc. Method and apparatus for making electrical connections utilizing a dielectric-like metal film. 4,681,778, Cl. 427-96.000.

Young, Raymond W.: *See*—
Lund, Eric W.; and Young, Raymond W., 4,682,310, Cl. 368-278.000.

Young, Rodney C.: *See*—
Brown, Thomas H.; Mitchell, Robert C.; Smith, Ian R.; and Young, Rodney C., 4,681,883, Cl. 514-212.000.

Yuki, Heimei; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Polymerizable, optically active polymer and process for preparing polymerizable polymer. 4,681,919, Cl. 525-292.000.

Yurczyk, Roger F.: *See*—
Glenn, Gary S.; Rajpaul, Vinod K.; and Yurczyk, Roger F., 4,681,602, Cl. 55-21.000.

Zabrodsky, Vladimir: *See*—
Brychta, Ondrej; and Zabrodsky, Vladimir, 4,681,100, Cl. 128-204.250.

Zahavi, Joseph: *See*—
Halliwell, Michael J.; and Zahavi, Joseph, 4,681,774, Cl. 427-53.100.

Zahner, John C.: *See*—
Graven, Richard G.; and Zahner, John C., 4,681,674, Cl. 208-59.000.

Zammarchi, Gino: *See*—
Lombard, Claude; Brisset, Jean-Paul; Catier, Gerard; Marais, Jean-Luc; and Zammarchi, Gino, 4,682,104, Cl. 324-208.000.

Zborowski, David G., to Caterpillar Inc. Method and apparatus for tensioning frictionally driven, ground engaging belts. 4,681,177, Cl. 180-9.560.

Zechnall, Martin: *See*—
Kirschner, Michael; Rapp, Gunter; and Zechnall, Martin, 4,682,049, Cl. 307-268.000.

Zenith Electronics Corporation: *See*—
Kadlec, Joseph, 4,682,226, Cl. 358-148.000.

Zerfass, Hans-Rainer; and Giesen, Franz-Josef, to Goetze AG. Impregnated, soft, flat gasket and manufacturing method. 4,681,800, Cl. 428-283.000.

Zerpner, Dieter; Streck, Roland; and Haag, Horst G., to Huels Aktiengesellschaft. Adhesion promoters for the production of volcanizates having a favorable filler/elastomer bond. 4,681,961, Cl. 556-428.000.

Zibis, Peter: *See*—
Bulst, Wolf-Eckhart; Lindemann, Gertrud; and Zibis, Peter, 4,682,130, Cl. 333-195.000.

Ziegler, Gunther: *See*—
Wahling, Werner; and Ziegler, Gunther, 4,680,984, Cl. 74-574.000.

Zilinskas, Gene. Racket having unique string mount. 4,681,319, Cl. 273-73.00D.

Zimmerman, Sheldon B.: *See*—
Wilson, Kenneth E.; Monaghan, Richard L.; DeRiso, Cheryl; Zimmerman, Sheldon B.; Hensens, Otto D.; Flor, James E.; Del Val, Sagrario M.; and Fernandez, Maria I. M., 4,681,846, Cl. 435-124.000.

Zimmermann, Gert, to F. Zimmermann & Co. Device for counting and sorting coins belonging to a set of coins. 4,681,204, Cl. 194-317.000.

Ziogas, Phoivos D.: *See*—
Huynh, Anh N.; and Ziogas, Phoivos D., 4,682,266, Cl. 361-235.000.

Zoleski, Benjamin H.; Crawford, Wheeler C.; and Sung, Rodney L., to Texaco Inc. Marine crankcase lubricant. 4,681,694, Cl. 252-51.50R.

Zuccarelli, Hugo. Process for forming an acoustic monitoring device. 4,680,856, Cl. 29-594.000.

Zupanovich, John D.: *See*—
Walker, Jerry L.; and Zupanovich, John D., 4,681,737, Cl. 422-16.000.

Zurilla, Ronald W.; and Huff, John, to Ford Motor Company. Alkaline resistant phosphate conversion coatings. 4,681,641, Cl. 148-6.15Z.

Zweifel, Hans: *See*—
Fischer, Walter; Finter, Jurgen; and Zweifel, Hans, 4,681,950, Cl. 549-27.000.

501 USM Corporation: *See*—
Moran, Michael J.; and Kemnitz, Tadeusz, 4,681,176, Cl. 177-114.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JULY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Di Peri, Leonard J. Modular dry-air evaporative cooler. Re. 32,461, Cl. 62-314.000.

Hitachi, Ltd.: *See*—
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.

Leggett, Archie L., Jr., to R & L Enterprises, Inc. Diskette punch with attached gage. Re. 32,460, Cl. 30-363.000.

Nishida, Hideo: *See*—
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.

R & L Enterprises, Inc.: *See*—
Leggett, Archie L., Jr., Re. 32,460, Cl. 30-363.000.

Ueda, Shinjiro: *See*—
Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, Re. 32,462, Cl. 415-211.000.

Yoshinaga, Yoichi; Ueda, Shinjiro; and Nishida, Hideo, to Hitachi, Ltd. Centrifugal fluid machine. Re. 32,462, Cl. 415-211.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., to Dyonics, Inc. Surgical instrument suitable for closed surgery such as of the knee. B1 4,203,444, 7-21-87, Cl. 604-22.000.

Chapman, Emmett H. Method of playing stringed musical instrument. B1 4,142,436, 7-21-87, Cl. 84-1.160.

Don Badische Company: *See*—
Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., B1 3,762,220, Cl. 73-160.000.

Dyonics, Inc.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.

Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., to Don Badische Company. Continuous evaluation of yarn crimp. B1 3,762,220, 7-21-87, Cl. 73-160.000.

Johnson, Lanny L.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.

Lex Tex Ltd.: *See*—
Scragg, Ernest P. R., B1 3,472,011, Cl. 57-290.000.

McHugh, Edward H.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.

Scragg, Ernest P. R., to Lex Tex Ltd. Treatment of artificial yarns and threads. B1 3,472,011, 7-21-87, Cl. 57-290.000.

Sjostrom, Douglas D.: *See*—
Bonnell, Leonard J.; McHugh, Edward H.; Sjostrom, Douglas D.; and Johnson, Lanny L., B1 4,203,444, Cl. 604-22.000.

Stephens, Bernard B.: *See*—
Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., B1 3,762,220, Cl. 73-160.000.

Stevens, James A.: *See*—
Gusack, James A.; Stephens, Bernard B.; and Stevens, James A., B1 3,762,220, Cl. 73-160.000.

LIST OF DESIGN PATENTEES

A/S Grorud Jernvarefabrik: *See*—
Strandengen, Einar, 290,928, Cl. D8-349.000.

Abbestam, Goran; and Lachonius, Leif, to Aktiebolaget SKF. Conveyor chain link. 290,932, 7-21-87, Cl. D8-499.000.

Accessories by Us, Inc.: *See*—
Thomas, Suzanne, 290,908, Cl. D3-71.000.

Aktiebolaget SKF: *See*—
Abbestam, Goran; and Lachonius, Leif, 290,932, Cl. D8-499.000.

Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girten, Patrick C., to Baldt Incorporated. Anchor. 290,947, 7-21-87, Cl. D12-215.000.

American Greetings Corporation: *See*—
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,980, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,981, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,982, Cl. D21-159.000.

Anderson, Walter F., Jr.: *See*—
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.

Antonious, Anthony J. Golf club head. 290,984, 7-21-87, Cl. D21-219.000.

Asics Corporation: *See*—
Inohara, Masanobu; and Hase, Yoshiaki, 290,903, Cl. D2-320.000.

Autech Partners Ltd.: *See*—
Brann, James E., 290,960, Cl. D14-102.000.

Babros, Ronald E.; and Cesaroni, William C., to Dart Industries Inc. Base for an appliance such as an iron. 291,016, 7-21-87, Cl. D32-73.000.

Bajo, Ricardo. Festooned pinata. 290,976, 7-21-87, Cl. D21-59.000.

Bajo, Ricardo. Festooned pinata. 290,977, 7-21-87, Cl. D21-59.000.

Baldt Incorporated: *See*—
Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girten, Patrick C., 290,947, Cl. D12-215.000.

Ball, Joyce A.; and McKettrick, Glen W. Electrically heated comforter or the like. 290,918, 7-21-87, Cl. D6-603.000.

Baxter Travenol Laboratories, Inc.: *See*—
Keilman, Michael R.; and West, Richard L., 291,004, Cl. D24-56.000.

Bayliner Marine Corporation: *See*—
Scarboro, Clark T., 290,949, Cl. D12-315.000.

Becton, Dickinson and Company: *See*—
Novak, Robert M., 290,999, Cl. D24-8.000.

Berkowicz, Michael Z.: *See*—
Sklaar, Michael E.; and Berkowicz, Michael Z., 290,953, Cl. D14-33.000.

Berlese, Remo. Kidney belt pad. 291,005, 7-21-87, Cl. D24-64.000.

Beute, William M. Combined hand-held plate and beverage holder. 290,919, 7-21-87, Cl. D7-38.000.

Bingham, Grady A., to Thermal Concepts, Inc. Compact heat exchanger. 290,996, 7-21-87, Cl. D23-136.000.

Blissett, Malcolm G.: *See*—
Schornstein, Michael M.; and Blissett, Malcolm G., 290,900, Cl. D2-293.000.

Botich, Michael J., to Unitek Corporation. Combined injector gun, cap, and power unit for dental treatment. 291,000, 7-21-87, Cl. D24-10.000.
Brann, James E., to Autech Partners Ltd. Cabinet for process data acquisition and control equipment. 290,960, 7-21-87, Cl. D14-102.000.
Bridgestone Corporation: *See—*
Matsuda, Hideki, 290,941, Cl. D12-142.000.
Brown Group Recreational Products, Inc.: *See—*
Smith, Stephen W.; and Ziegler, William H., Jr., 290,940, Cl. D12-113.000.
Broyles, Wayne R.: *See—*
Minichillo, Ronald A.; and Broyles, Wayne R., 291,006, Cl. D25-69.000.
Bruder, Ulf, to Innofibre AB. Wheel. 290,946, 7-21-87, Cl. D12-205.000.
Brunswick Corporation: *See—*
Robbins, Richard J.; and Stiner, Roy, 290,987, Cl. D22-141.000.
Ten Eyck, Richard E.; and Israel, Gary P., 290,989, Cl. D22-141.000.
Bulgari, Marina, to Marina B Creation S.A. Necklace. 290,938, 7-21-87, Cl. D11-3.000.
Burridge, Christopher A.: *See—*
Steadman, Alan E.; and Burridge, Christopher A., 290,910, Cl. D4-136.000.
Butcher, Roger. Sign. 290,974, 7-21-87, Cl. D20-38.000.
Bycraft, John T.: *See—*
Pomeroy, Charles; and Bycraft, John T., 290,911, Cl. D6-347.000.
Capo, Carl L.: *See—*
Capo, James L.; and Capo, Carl L., 290,978, Cl. D21-82.000.
Capo, James L.; and Capo, Carl L. Flying toy. 290,978, 7-21-87, Cl. D21-82.000.
Carlson, Arthur R., to Decor Corporation Proprietary Limited, The. Beverage serving stand. 290,914, 7-21-87, Cl. D6-474.000.
Cassina S.p.A.: *See—*
Rodriquez, Rodrigo, 290,912, Cl. D6-367.000.
CertainTeed Corporation: *See—*
Reisinger, Ludwig; and Westphal, Dennis, 291,007, Cl. D25-74.000.
Reisinger, Ludwig; and Westphal, Dennis, 291,008, Cl. D25-74.000.
Cesaroni, William C.: *See—*
Babros, Ronald E.; and Cesaroni, William C., 291,016, Cl. D32-73.000.
Citizen Watch Co., Ltd.: *See—*
Mochizuki, Nobutoshi, 290,967, Cl. D18-13.000.
Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH. Fountain brush. 290,909, 7-21-87, Cl. D4-115.000.
Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH & Co. KG. Spray nozzle. 290,993, 7-21-87, Cl. D23-35.000.
Conair Corporation: *See—*
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 290,955, Cl. D14-62.000.
Conti, Rino: *See—*
Zaruba, John V.; Conti, Rino; and Morrison, Howard J., 290,920, Cl. D7-43.000.
Crouch, Edward M. Dickey. 290,904, 7-21-87, Cl. D2-602.000.
Daenen, Robert H. C. M., to Dart Industries Inc. Cover or the like. 290,924, 7-21-87, Cl. D7-391.000.
Daiwa Seiko, Inc.: *See—*
Yamaguchi, Kaname, 290,986, Cl. D22-137.000.
Dardashti, Jamshid, to J & F Import-Export International, Inc. Battery powered flour sifter. 290,921, 7-21-87, Cl. D7-47.000.
Dart Industries Inc.: *See—*
Babros, Ronald E.; and Cesaroni, William C., 291,016, Cl. D32-73.000.
Daenen, Robert H. C. M., 290,924, Cl. D7-391.000.
Davidson, William: *See—*
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,980, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,981, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,982, Cl. D21-159.000.
Decor Corporation Proprietary Limited, The: *See—*
Carlson, Arthur R., 290,914, Cl. D6-474.000.
Denroy Plastics Limited: *See—*
Steadman, Alan E.; and Burridge, Christopher A., 290,910, Cl. D4-136.000.
Devino, Vincent A., to Grumman Aerospace Corporation. Aircraft flight instrument. 290,937, 7-21-87, Cl. D10-67.000.
Diamond, Harvey E. Overflow cavity and cover for bathtub. 290,995, 7-21-87, Cl. D23-69.000.
Dikoff, Joseph K. Golf tool. 290,985, 7-21-87, Cl. D21-234.000.
Doi, Tetsuyuki: *See—*
Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, 290,966, Cl. D18-13.000.
Druihet, Harold N. Safe. 291,019, 7-21-87, Cl. D99-28.000.
Ehco, Inc.: *See—*
Erickson, Fredrick J., 290,923, Cl. D7-337.000.
Eldon Industries, Inc.: *See—*
Pagani, David A., 290,927, Cl. D8-30.000.
Embra, Maurice C. Plywood carrier. 290,926, 7-21-87, Cl. D8-14.000.
Erickson, Fredrick J., to Ehco, Inc. Barbeque grill. 290,923, 7-21-87, Cl. D7-337.000.
Fenne, Kenneth R., to Pittway Corporation. Flashlight. 291,010, 7-21-87, Cl. D26-46.000.
Fleming, William C. Camping light standard. 291,011, 7-21-87, Cl. D26-138.000.
Gardena Kress & Kastner GmbH: *See—*
Clivio, Franco; and Raffler, Dieter, 290,909, Cl. D4-115.000.
Gardena Kress & Kastner GmbH & Co. KG: *See—*
Clivio, Franco; and Raffler, Dieter, 290,993, Cl. D23-35.000.
Gaskins, Jean. Tongue scraper. 291,001, 7-21-87, Cl. D24-10.000.
Geisler, Henry O., to Gem Top Mfg. Inc. Pickup canopy. 290,945, 7-21-87, Cl. D12-156.000.
Gem Top Mfg. Inc.: *See—*
Geisler, Henry O., 290,945, Cl. D12-156.000.
Gemmill, Roderique S., to Radiation Concepts, Inc. Portable x-ray film printer for imprinting patient information or the like on unexposed portion of x-ray film. 290,998, 7-21-87, Cl. D24-2.000.
General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi, 290,957, Cl. D14-68.000.
Girten, Patrick C.: *See—*
Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girten, Patrick C., 290,947, Cl. D12-215.000.
Groschupp, Dieter. Tripod. 290,963, 7-21-87, Cl. D16-45.000.
Grum, Matthew W. Pet enclosure bag for pest eradication, transportation and security. 291,014, 7-21-87, Cl. D30-1.000.
Grumman Aerospace Corporation: *See—*
Devino, Vincent A., 290,937, Cl. D10-67.000.
Haber, Barry M.: *See—*
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 290,955, Cl. D14-62.000.
Hanback, Francis J. Ultralight aircraft. 290,951, 7-21-87, Cl. D12-322.000.
Harding, David R., to Micro Component Technology, Inc. Electronic component vertical stack feed apparatus for use in printed circuit assembly machines. 290,962, 7-21-87, Cl. D15-199.000.
Hardion, Jacques P., to Produits Ceramiques de Touraine. Water closet. 290,994, 7-21-87, Cl. D23-65.000.
Harrison, Christopher R. B.: *See—*
Pittaway, Alan K.; and Harrison, Christopher R. B., 290,925, Cl. D8-5.000.
Hase, Yoshiaki: *See—*
Inohara, Masanobu; and Hase, Yoshiaki, 290,903, Cl. D2-320.000.
Herrera, Freddy. Beverage can holder. 290,922, 7-21-87, Cl. D7-70.000.
Hill, Charles P.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet spout. 290,992, 7-21-87, Cl. D23-32.000.
Hill, Michael W. Clock design. 290,936, 7-21-87, Cl. D10-25.000.
Hill, Royce W., to Micro Plastics, Inc. Printed circuit board stand-off. 290,929, 7-21-87, Cl. D8-354.000.
Hill, Royce W., to Micro Plastics, Inc. Circuit board support. 290,930, 7-21-87, Cl. D8-354.000.
Hitachi, Ltd.: *See—*
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.
Hledin, Peter C. Catamaran type boat. 290,948, 7-21-87, Cl. D12-310.000.
Hoover, Thomas W. Work table for a knitting machine or the like. 290,915, 7-21-87, Cl. D6-477.000.
Huckstep, Ronald L. Knee prosthesis. 291,003, 7-21-87, Cl. D24-33.000.
Hunt-Wesson Foods, Inc.: *See—*
Maginnis, William S., Jr., 290,933, Cl. D9-385.000.
Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Hand-held scanning receiver. 290,957, 7-21-87, Cl. D14-68.000.
Innofibre AB: *See—*
Bruder, Ulf, 290,946, Cl. D12-205.000.
Inohara, Masanobu; and Hase, Yoshiaki, to Asics Corporation. Shoe sole. 290,903, 7-21-87, Cl. D2-320.000.
International Business Machines Corporation: *See—*
Mendel, Peter J., 290,961, Cl. D14-107.000.
Irby, Daniel L. Cover for a vehicle brake fluid reservoir. 290,943, 7-21-87, Cl. D12-155.000.
Irby, Daniel L. Cover for a vehicle brake fluid reservoir. 290,944, 7-21-87, Cl. D12-155.000.
Irie Co., Ltd.: *See—*
Irie, Kenji, 290,972, Cl. D19-90.000.
Irie, Kenji, to Irie Co., Ltd. Magnetic holder for a piece of paper. 290,972, 7-21-87, Cl. D19-90.000.
Ishii, Koji: *See—*
Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, 290,966, Cl. D18-13.000.
Israel, Gary P.: *See—*
Ten Eyck, Richard E.; and Israel, Gary P., 290,989, Cl. D22-141.000.
Itoh, Yutaka: *See—*
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.
Izzi, Lewis B., to Plastic Oddities, Inc. Insulated cover for a faucet or the like. 290,990, 7-21-87, Cl. D23-1.000.
J & F Import-Export International, Inc.: *See—*
Dardashti, Jamshid, 290,921, Cl. D7-47.000.
Jack-Post Corporation: *See—*
Pomeroy, Charles; and Bycraft, John T., 290,911, Cl. D6-347.000.
Kalbach, Edward V. L. Eyeglass side guard. 290,964, 7-21-87, Cl. D16-123.000.
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, to Matsushita Electric Industrial Co., Ltd. Combined telephone, clock, radio and television receiver. 290,958, 7-21-87, Cl. D14-79.000.
Keilman, Michael R.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Pooling container for parenteral fluids and the like. 291,004, 7-21-87, Cl. D24-56.000.
Kelley, Brenda, to Pensa, Inc. Shoe sole. 290,902, 7-21-87, Cl. D2-320.000.

Kemberly, Inc.: *See—*
Minichillo, Ronald A.; and Broyles, Wayne R., 291,006, Cl. D25-69.000.
King, Charles B. Gun rack. 290,907, 7-21-87, Cl. D3-38.000.
Kokoszka, Stephen A.: *See—*
Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girten, Patrick C., 290,947, Cl. D12-215.000.
Kouno, Shuichi: *See—*
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.
Kucharik, Elena: *See—*
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,980, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,981, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,982, Cl. D21-159.000.
Labor-Management Publications, Inc.: *See—*
Mahoney, Christine, 290,975, Cl. D21-25.000.
Lachonius, Leif: *See—*
Abbestam, Goran; and Lachonius, Leif, 290,932, Cl. D8-499.000.
Lates, Kornel, to Scepter Manufacturing Co. Ltd. Citrus crate. 291,018, 7-21-87, Cl. D34-46.000.
Lerner, Kurt J. Jewelry pendant or the like. 290,939, 7-21-87, Cl. D11-81.000.
Liljeqvist, Lars. Lamp. 291,012, 7-21-87, Cl. D26-104.000.
Lux, John S. Cabinet for spools of sewing thread or the like. 290,906, 7-21-87, Cl. D3-25.000.
Madison, Debbie A.; and Madison, Michael G. Bathtub mat. 290,916, 7-21-87, Cl. D6-583.000.
Madison, Michael G.: *See—*
Madison, Debbie A.; and Madison, Michael G., 290,916, Cl. D6-583.000.
Maginnis, William S., Jr., to Hunt-Wesson Foods, Inc. Bottle. 290,933, 7-21-87, Cl. D9-385.000.
Magness, Ronald. Trailer stand. 291,017, 7-21-87, Cl. D34-31.000.
Mahoney, Christine, to Labor-Management Publications, Inc. Game board. 290,975, 7-21-87, Cl. D21-25.000.
Marina B Creation S.A.: *See—*
Bulgari, Marina, 290,938, Cl. D11-3.000.
Marvin Glass & Associates: *See—*
Zaruba, John V.; Conti, Rino; and Morrison, Howard J., 290,920, Cl. D7-43.000.
Masco Corporation of Indiana: *See—*
Hill, Charles P.; and Spangler, Anthony G., 290,992, Cl. D23-32.000.
Matsuda, Hideki, to Bridgestone Corporation. Automobile tire. 290,941, 7-21-87, Cl. D12-142.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.
McClellan, Arthur W.: *See—*
Albertini, Rocco D.; McClellan, Arthur W.; Kokoszka, Stephen A.; and Girten, Patrick C., 290,947, Cl. D12-215.000.
McDonald Products Corporation: *See—*
O'Neil, Robert A., 290,973, Cl. D19-92.000.
McKettrick, Glen W.: *See—*
Ball, Joyce A.; and McKettrick, Glen W., 290,918, Cl. D6-603.000.
Mendel, Peter J., to International Business Machines Corporation. Work-station controller. 290,961, 7-21-87, Cl. D14-107.000.
Messer, Ronald L., to Michelin Recherche et Technique S.A. Tire. 290,942, 7-21-87, Cl. D12-147.000.
Michelin Recherche et Technique S.A.: *See—*
Messer, Ronald L., 290,942, Cl. D12-147.000.
Micro Component Technology, Inc.: *See—*
Harding, David R., 290,962, Cl. D15-199.000.
Micro Plastics, Inc.: *See—*
Hill, Royce W., 290,929, Cl. D8-354.000.
Hill, Royce W., 290,930, Cl. D8-354.000.
Minichillo, Ronald A.; and Broyles, Wayne R., to Kemberly, Inc. Extrusion for ladder step. 291,006, 7-21-87, Cl. D25-69.000.
Minnesota Mining & Manufacturing Co.: *See—*
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Minolta Camera K.K.: *See—*
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Mochizuki, Nobutoshi, to Citizen Watch Co., Ltd. Printer. 290,967, 7-21-87, Cl. D18-13.000.
Morrison, Howard J.: *See—*
Zaruba, John V.; Conti, Rino; and Morrison, Howard J., 290,920, Cl. D7-43.000.
Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 290,988, 7-21-87, Cl. D22-141.000.
Nishiseko, Jun: *See—*
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Northern Telecom Limited: *See—*
Read, Clifford D., 290,954, Cl. D14-61.000.
Novak, Robert M., to Becton, Dickinson and Company. Vial. 290,999, 7-21-87, Cl. D24-8.000.
O'Neil, Robert A., to McDonald Products Corporation. Desk console element. 290,973, 7-21-87, Cl. D19-92.000.
Onishi, Takako: *See—*
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Ooie, Yoshihisa, to Sharp Corporation. Facsimile machine. 290,959, 7-21-87, Cl. D14-94.000.
Pagani, David A., to Eldon Industries, Inc. Soldering station. 290,927, 7-21-87, Cl. D8-30.000.
Paul Associates, Inc.: *See—*
Paul, Stanley M., 290,991, Cl. D23-25.000.
Paul, Stanley M., to Paul Associates, Inc. Faucet. 290,991, 7-21-87, Cl. D23-25.000.
Pensa, Inc.: *See—*
Kelley, Brenda, 290,902, Cl. D2-320.000.
Tong, James K.; and Peterson, Robert L., 290,901, Cl. D2-314.000.
Peterson, Robert L.: *See—*
Tong, James K.; and Peterson, Robert L., 290,901, Cl. D2-314.000.
Pilot Ink Co., Ltd.: *See—*
Sato, Akito, 290,979, Cl. D21-148.000.
Pittaway, Alan K.; and Harrison, Christopher R. B., to Wilkinson Sword Limited. Shank for a garden shear. 290,925, 7-21-87, Cl. D8-5.000.
Pittway Corporation: *See—*
Fenne, Kenneth R., 291,010, Cl. D26-46.000.
Plastic Oddities, Inc.: *See—*
Izzi, Lewis B., 290,990, Cl. D23-1.000.
Plummer, Marvin W. Combined disposable razor and shaving cream container. 291,013, 7-21-87, Cl. D28-46.000.
Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Glider seat. 290,911, 7-21-87, Cl. D6-347.000.
Powell, Jerald C. Ladder hook bracket. 290,931, 7-21-87, Cl. D8-373.000.
Price, John, to Xyvision, Inc. Panel for phototypesetter or the like. 290,952, 7-21-87, Cl. D13-35.000.
Procter & Gamble Company, The: *See—*
Rader, Vernon C., 290,934, Cl. D9-413.000.
Produits Ceramiques de Touraine: *See—*
Hardion, Jacques P., 290,994, Cl. D23-65.000.
Quilty, Tom. Musical clef paper clip. 290,971, 7-21-87, Cl. D19-65.000.
Rader, Vernon C., to Procter & Gamble Company, The. Bottle. 290,934, 7-21-87, Cl. D9-413.000.
Radiation Concepts, Inc.: *See—*
Gemmill, Roderique S., 290,998, Cl. D24-2.000.
Raffler, Dieter: *See—*
Clivio, Franco; and Raffler, Dieter, 290,909, Cl. D4-115.000.
Clivio, Franco; and Raffler, Dieter, 290,993, Cl. D23-35.000.
Read, Clifford D., to Northern Telecom Limited. Housing for credit card payment telephone. 290,954, 7-21-87, Cl. D14-61.000.
Reisinger, Ludwig; and Westphal, Dennis, to CertainTeed Corporation. Window component extrusion. 291,007, 7-21-87, Cl. D25-74.000.
Reisinger, Ludwig; and Westphal, Dennis, to CertainTeed Corporation. Window component extrusion. 291,008, 7-21-87, Cl. D25-74.000.
Rich, Beverly C. Receiving tray for a printer. 290,968, 7-21-87, Cl. D18-22.000.
Rich, Beverly C. Printer stand. 290,970, 7-21-87, Cl. D18-23.000.
Righter, Kemper H. Combined adjustable table and extendible shelf unit. 290,913, 7-21-87, Cl. D6-430.000.
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., to Conair Corporation. Telephone stand for a handset transceiver. 290,955, 7-21-87, Cl. D14-62.000.
Robbins, Richard J.; and Stiner, Roy, to Brunswick Corporation. Spin cast fishing reel. 290,987, 7-21-87, Cl. D22-141.000.
Rodriquez, Rodrigo, to Cassina S.p.A. Adjustable sofa. 290,912, 7-21-87, Cl. D6-367.000.
Rollins, Kenneth S., Jr. Bear sleeping bag and rug. 290,917, 7-21-87, Cl. D6-589.000.
Ryobi Ltd.: *See—*
Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, 290,966, Cl. D18-13.000.
Sabo, Brian D.: *See—*
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Saito, Toshiaki; Ishii, Koji; and Doi, Tetsuyuki, to Ryobi Ltd. Printing machine. 290,966, 7-21-87, Cl. D18-13.000.
Satalof, Stuart L.; and Weiner, Steven I., to Weiner, Steven I. Piston valve assembly oil shield. 290,965, 7-21-87, Cl. D17-13.000.
Sato, Akito, to Pilot Ink Co., Ltd. Toy cow. 290,979, 7-21-87, Cl. D21-148.000.
Scarboro, Clark T., to Bayliner Marine Corporation. Cruising yacht. 290,949, 7-21-87, Cl. D12-315.000.
Scepter Manufacturing Co. Ltd.: *See—*
Lates, Kornel, 291,018, Cl. D34-46.000.
Scholl, Inc.: *See—*
Schornstein, Michael M.; and Blissett, Malcolm G., 290,900, Cl. D2-293.000.
Schornstein, Michael M.; and Blissett, Malcolm G., to Scholl, Inc. Sandal. 290,900, 7-21-87, Cl. D2-293.000.
Selig, Julie A., to 'totes', incorporated. Umbrella handle. 290,905, 7-21-87, Cl. D3-16.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,980, 7-21-87, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,981, 7-21-87, Cl. D21-159.000.

Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., to American Greetings Corporation. Toy bear figure. 290,982, 7-21-87, Cl. D21-159.000.
Sharp Corporation: *See*—
Ooie, Yoshihisa, 290,959, Cl. D14-94.000.
Shimano Industrial Company Limited: *See*—
Myojo, Seiji, 290,988, Cl. D22-141.000.
Sklaar, Michael E.; and Berkowicz, Michael Z. Speaker enclosure. 290,953, 7-21-87, Cl. D14-33.000.
Smith, Stephen W.; and Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Knock-down tricycle. 290,940, 7-21-87, Cl. D12-113.000.
Spangler, Anthony G.: *See*—
Hill, Charles P.; and Spangler, Anthony G., 290,992, Cl. D23-32.000.
Spindle, Michael J.: *See*—
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,980, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,981, Cl. D21-159.000.
Shaffer, Ralph; Davidson, William; Kucharik, Elena; and Spindle, Michael J., 290,982, Cl. D21-159.000.
Steadman, Alan E.; and Burridge, Christopher A., to Denroy Plastics Limited. Hairbrush. 290,910, 7-21-87, Cl. D4-136.000.
Stiner, Roy: *See*—
Robbins, Richard J.; and Stiner, Roy, 290,987, Cl. D22-141.000.
Strandengen, Einar, to A/S Grorud Jernvarefabrik. Slideable, resilient guide block for windows. 290,928, 7-21-87, Cl. D8-349.000.
Strickland, Allen. Boat accessory extrusion. 290,950, 7-21-87, Cl. D12-317.000.
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., to Minolta Camera K.K.; and Minnesota Mining & Manufacturing Co. Remote controller for a printer. 290,969, 7-21-87, Cl. D18-22.000.
Taylor, Mark L. Training harness for track and field athletes. 290,983, 7-21-87, Cl. D21-191.000.
Ten Eyck, Richard E.; and Israel, Gary P., to Brunswick Corporation. Spinning fishing reel. 290,989, 7-21-87, Cl. D22-141.000.
Thermal Concepts, Inc.: *See*—
Bingham, Grady A., 290,996, Cl. D23-136.000.
Thomas, Suzanne, to Accessories by Us, Inc. Combined carrying bag for infant accessories and changing mat. 290,908, 7-21-87, Cl. D3-71.000.
Tong, James K.; and Peterson, Robert L., to Pensa, Inc. Shoe upper. 290,901, 7-21-87, Cl. D2-314.000.
Torrens, Derald R.; and Torrens, Joann. Horse muzzle. 291,015, 7-21-87, Cl. D30-33.000.
Torrens, Joann: *See*—
Torrens, Derald R.; and Torrens, Joann, 291,015, Cl. D30-33.000.
'totes', incorporated: *See*—
Selig, Julie A., 290,905, Cl. D3-16.000.
Tsubaki, Hiroyuki: *See*—
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.
Tsumurai, Yasuo: *See*—
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.
Uematsu, Toyoyuki: *See*—
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.
Unitek Corporation: *See*—
Botich, Michael J., 291,000, Cl. D24-10.000.
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, to Hitachi, Ltd. Electric fan. 290,997, 7-21-87, Cl. D23-155.000.
Weilow, Gerth. Extrusion. 291,009, 7-21-87, Cl. D25-75.000.
Weiner, Steven I.: *See*—
Satalof, Stuart L.; and Weiner, Steven I., 290,965, Cl. D17-13.000.
West, Richard L.: *See*—
Keilman, Michael R.; and West, Richard L., 291,004, Cl. D24-56.000.
Westphal, Dennis: *See*—
Reisinger, Ludwig; and Westphal, Dennis, 291,007, Cl. D25-74.000.
Reisinger, Ludwig; and Westphal, Dennis, 291,008, Cl. D25-74.000.
Wilkinson Sword Limited: *See*—
Pittaway, Alan K.; and Harrison, Christopher R. B., 290,925, Cl. D8-5.000.
Williams, Charles G. D. Handle for packages or the like. 290,935, 7-21-87, Cl. D9-434.000.
Witham, Frederick G. Combined shoulder rest for a telephone handset and an adapter therefor. 290,956, 7-21-87, Cl. D14-65.000.
Wong, Ting W.: *See*—
Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., 290,955, Cl. D14-62.000.
Xyvision, Inc.: *See*—
Price, John, 290,952, Cl. D13-35.000.
Yamagishi, Seiichi: *See*—
Sutou, Masatoki; Nishiseko, Jun; Onishi, Takako; Yamagishi, Seiichi; Anderson, Walter F., Jr.; and Sabo, Brian D., 290,969, Cl. D18-22.000.
Yamaguchi, Kastame, to Daiwa Seiko, Inc. Fishing reel spool. 290,986, 7-21-87, Cl. D22-137.000.
Yamamoto, Masaki: *See*—
Kawata, Yoshiaki; Yamamoto, Masaki; Uematsu, Toyoyuki; Tsubaki, Hiroyuki; and Itoh, Yutaka, 290,958, Cl. D14-79.000.
Yanagisawa, Kazunori: *See*—
Utsuki, Toshiyuki; Kouno, Shuichi; Yanagisawa, Kazunori; and Tsumurai, Yasuo, 290,997, Cl. D23-155.000.
Zaruba, John V.; Conti, Rino; and Morrison, Howard J., to Marvin Glass & Associates. Ice cream sandwich maker or the like. 290,920, 7-21-87, Cl. D7-43.000.
Ziegler, William H., Jr.: *See*—
Smith, Stephen W.; and Ziegler, William H., Jr., 290,940, Cl. D12-113.000.
Zimmerman, James B. Dental tray rack. 291,002, 7-21-87, Cl. D24-31.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 21, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	4,680,812
	4,680,813
	4,680,814
171.3	4,680,815

CLASS 4

240	4,680,816
663	4,680,817

CLASS 5

81 R	4,680,818
86	4,680,819
413	4,680,821
421	4,680,822
451	4,680,820

CLASS 8

111	4,681,592
115.68	4,681,591
128 R	4,681,593
489	4,681,594
	4,681,595
620	4,681,596

CLASS 10

86 A	4,680,823

CLASS 15

104.165	4,680,824
105	4,680,825
147 R	4,680,826
319	4,680,827

CLASS 16

90	4,680,828
114 A	4,680,829
241	4,680,830

CLASS 17

23	4,680,831
25	4,680,832

CLASS 19

244	4,680,833

CLASS 24

16 PB	4,680,834
117	4,680,835
150 FP	4,680,836
237	4,680,837
442	4,680,838

CLASS 26

89	4,680,839

CLASS 29

25.35	4,680,840
33 M	4,680,841
33 P	4,680,842
116 R	4,680,843
156.4 R	4,680,844
157 R	4,680,845
168	4,680,846
173	4,680,847
213 R	4,680,848
252	4,680,849
426.3	4,680,850
433	4,680,851
461	4,680,852
571	4,680,853
576 B	4,680,854
583	4,680,855
594	4,680,856
596	4,680,857
610 SG	4,680,858
611	4,680,859
804	4,680,860

CLASS 30

296 A	4,680,861
363	Re.32,460
381	4,680,862
511	4,680,863

CLASS 33

26	4,680,864
143 L	4,680,865
356	4,680,866
391	4,680,867
503	4,680,868
533	4,680,869
540	4,680,870

CLASS 34

1	4,680,871
23	4,680,872
116	4,680,873
143	4,680,874

CLASS 36

31	4,680,875
35 B	4,680,876
44	4,680,877
117	4,680,878

CLASS 37

67	4,680,879
236	4,680,880
237	4,680,881

CLASS 40

5	4,680,882
471	4,680,883

CLASS 42

66	4,680,884

CLASS 43

19.2	4,680,885
57.1	4,680,886
100	4,680,887

CLASS 44

1 SR	4,681,598
15 R	4,681,597

CLASS 47

58	4,680,888
	4,680,889

CLASS 48

92	4,681,599

CLASS 49

55	4,680,890
280	4,680,891
374	4,680,892

CLASS 51

5 R	4,680,893
50 R	4,680,894
170 R	4,680,895
215 UE	4,680,896
281 R	4,680,897
293	4,681,600
419	4,680,898
427	4,680,899
430	4,680,900

CLASS 52

81	4,680,901
126.4	4,680,902
127.8	4,680,903
169.12	4,680,904
200	4,680,905
223 L	4,680,906
309.17	4,680,907
378	4,680,908
409	4,680,909
489	4,680,910
521	4,680,911
721	4,680,912
746	4,680,913
747	4,680,914
766	4,680,915

CLASS 53

440	4,680,916
	4,680,917
466	4,680,918
499	4,680,919
525	4,680,920

CLASS 54

49	4,680,921

CLASS 55

18	4,681,601
21	4,681,602
27	4,681,603
96	4,681,604
158	4,681,605
193	4,681,606
276	4,681,608
284	4,681,607
302	4,681,609
394	4,681,610

CLASS 56

7	4,680,922

CLASS 57

251	4,680,923
263	4,680,924
	4,680,925
290	B1 3,472,011

CLASS 59

27	4,680,926

CLASS 60

39.3	4,680,927
329	4,680,928
368	4,680,929
375	4,680,930
447	4,680,931
605	4,680,932
608	4,680,933
652	4,680,934

CLASS 62

3	4,681,611
23	4,681,612
45	4,680,935
	4,680,936
54	4,680,937
93	4,680,938
114	4,680,939
155	4,680,940
184	4,680,941
256	4,680,942
300	4,680,943
314	Re.32,461
342	4,680,944
514 R	4,680,945

CLASS 65

1	4,681,613
18.1	4,681,614
	4,681,615
114	4,681,616

CLASS 66

64	4,680,946
117	4,680,947

CLASS 68

3 R	4,680,948

CLASS 70

14	4,680,949

CLASS 71

86	4,681,617
92	4,681,618
	4,681,619
93	4,681,620
103	4,681,621
108	4,681,622

CLASS 72

130	4,680,950
160	4,680,951
161	4,680,952
250	4,680,953
405	4,680,954
462	4,680,955

CLASS 73

1 G	4,680,956
55	4,680,957
56	4,680,958
117	4,680,959
117.3	4,680,960
160	B1 3,762,220
170 R	4,680,961
189	4,680,962
204	4,680,963
	4,680,964
445	4,680,965
597	4,680,966
628	4,680,967
651	4,680,968
661	4,680,969
702	4,680,970
718	4,680,971
730	4,680,972
861.16	4,680,973
861.38	4,680,974
861.41	4,680,977
862.07	4,680,978
862.09	4,680,975
862.33	4,680,976

CLASS 74

7 E	4,680,979
125	4,680,980
422	4,680,981
424.8 R	4,680,982
474	4,680,983
574	4,680,984
785	4,680,985
866	4,680,986
	4,680,987
	4,680,988
867	4,680,989
868	4,680,990
	4,680,991
869	4,680,992

CLASS 75

0.5 B	4,681,623
10.19	4,681,627
28	4,681,624
53	4,681,625
68 A	4,681,626
118 R	4,681,628
246	4,681,629

CLASS 81

3.37	4,680,993
57.29	4,680,994
437	4,680,995
456	4,680,996
487	4,680,997

CLASS 82

1 C	4,680,998
36 B	4,680,999

CLASS 83

37	4,681,001
71	4,681,002
80	4,681,003
98	4,681,004
404.4	4,681,005
782	4,681,006
862	4,681,000

CLASS 84

1.1	4,681,007
1.16	B1 4,142,436
1.28	4,681,008
293	4,681,009
298	4,681,010
313	4,681,011
422 S	4,681,012

CLASS 89

1.815	4,681,013
1.816	4,681,014
8	4,681,015
	4,681,016
29	4,681,017
33.04	4,681,018
	4,681,019
138	4,681,020

CLASS 91

178	4,681,021
471	4,681,022
488	4,681,023

CLASS 98

34.6	4,681,024
58	4,681,025
115.2	4,681,026

CLASS 99

289 R	4,681,028
422	4,681,027
483	4,681,029
484	4,681,030
511	4,681,031

CLASS 100

34	4,681,032
118	4,681,033

CLASS 101

211	4,681,034
217	4,681,035

CLASS 102

275.3	4,681,036
310	4,681,037
464	4,681,038

CLASS 104

193	4,681,039

CLASS 105

3	4,681,040
355	4,681,041

CLASS 106

1.11	4,681,630
4	4,681,631
19	4,681,632
35	4,681,633
90	4,681,634
178	4,681,635
287.15	4,681,636
304	4,681,637
309	4,681,638

CLASS 108

6	4,681,042
153	4,681,043

CLASS 109

24.1	4,681,044

CLASS 110

345	4,681,045
346	4,681,046

CLASS 112

162	4,681,047
262.3	4,681,048
	4,681,049
278	4,681,050
306	4,681,051

CLASS 114

98	4,681,052
122	4,681,053
124	4,681,054
144 E	4,681,055
146	4,681,056
183 R	4,681,057
271	4,681,058
293	4,681,059
347	4,681,060

CLASS 116

279	4,681,061

CLASS 118

410	4,681,062

CLASS 119

1	4,681,063
21	4,681,064

CLASS 122

4 D	4,681,065
234	4,681,066

CLASS 123

41.1	4,681,067
41.86	4,681,068
90.27	4,681,069
179 H	4,681,070
180 R	4,681,071
193 P	4,681,072
206	4,681,073
271	4,681,074
339	4,681,075
488	4,681,076
489	4,681,077
490	4,681,078
491	4,681,079
506	4,681,080
522	4,681,081
643	4,681,082

CLASS 126

9 R	4,681,083
52	4,681,084
110 R	4,681,085
120	4,681,086
126	4,681,087
420	4,681,088
434	4,681,089

CLASS 127

30	4,681,639

CLASS 128

1 B	4,681,090
1 D	4,681,092
1 R	4,681,091
6	4,681,093
10	4,681,094
24.1	4,681,095
33	4,681,096
77	4,681,097
204.23	4,681,099
204.25	4,681,100
303 B	4,681,103
303 R	4,681,101
	4,681,102
303.1	4,681,104
303.17	4,681,105
305	4,681,106
325	4,681,107
334 R	4,681,108
335	4,681,109
343	4,681,110
419 D	4,681,112
419 PT	4,681,111
581	4,681,114
630	4,681,098
635	4,681,115
	4,681,116
642	4,681,117
643	4,681,118
660	4,681,119
	4,681,120
731	4,681,121
736	4,681,122
753	4,681,123

CLASS 131

109.1	4,681,124
336	4,681,125
370	4,681,126

CLASS 132

82 R	4,681,127

CLASS 136

205	4,681,981
249	4,681,982
255	4,681,983
258	4,681,984

CLASS 137

154	4,681,129
220	4,681,130
247.35	4,681,131
271	4,681,132
315	4,681,133
385	4,681,134
489.5	4,681,135
494	4,681,136
516.29	4,681,138
537	4,681,139
568	4,681,137
597	4,681,140
607	4,681,141
614.18	4,681,142
625.37	4,681,143

CLASS 141

1	4,681,144

CLASS 144

2 N	4,681,145
369	4,681,146

CLASS 148

1.5	4,681,640
6.15 Z	4,681,641
321	4,681,642

CLASS 149

21	4,681,643

CLASS 152

158	4,681,147
431	4,681,148

CLASS 156

39	4,681,644
73.1	4,681,645
157	4,681,646
172	4,681,647
210	4,681,648
285	4,681,649
378	4,681,650
382	4,681,651
613	4,681,652
614	4,681,653

630 4,681,654
632 4,681,655
645 4,681,656
657 4,681,657

CLASS 160

134 4,681,149

CLASS 162

156 4,681,658
360.1 4,681,659

CLASS 163

5 4,681,150

CLASS 164

76.1 4,681,151
477 4,681,152

CLASS 165

31 4,681,153
47 4,681,154
76 4,681,155
124 4,681,156
145 4,681,157

CLASS 166

77.5 4,681,158
124 4,681,159
212 4,681,160
227 4,681,161
242 4,681,162
278 4,681,163
304 4,681,164
312 4,681,165
345 4,681,166
371 4,681,167
381 4,681,168
385 4,681,169

CLASS 173

50 4,681,170
90 4,681,171
139 4,681,172

CLASS 174

73 R 4,681,985
84 R 4,681,986

CLASS 175

7 4,681,173
330 4,681,174
393 4,681,175

CLASS 177

114 4,681,176

CLASS 180

9.56 4,681,177
68.3 4,681,178
68.4 4,681,179
76 4,681,180
79.1 4,681,181
4,681,182
4,681,183
141 4,681,184
247 4,681,185

CLASS 181

229 4,681,188

CLASS 182

47 4,681,186
129 4,681,187

CLASS 184

6.13 4,681,189

CLASS 187

101 4,681,190
119 4,681,191

CLASS 188

1.12 4,681,192
67 4,681,193
71.9 4,681,194

CLASS 190

2 4,681,195

CLASS 192

3 H 4,681,196
3 S 4,681,198
21.5 4,681,197
70.23 4,681,199
70.27 4,681,200
106.2 4,681,201
129 A 4,681,202

CLASS 193

35 R 4,681,203

CLASS 194

317 4,681,204

CLASS 196

46.1 4,681,660

CLASS 198

307.1 4,681,205
328 4,681,206
333 4,681,207
341 4,681,208
392 4,681,209
468.2 4,681,210
789 4,681,211
803.2 4,681,212
803.9 4,681,213
819 4,681,214
843 4,681,215

CLASS 200

5 A 4,681,987
16 B 4,681,994
17 R 4,681,988
19 R 4,681,989
48 KB 4,681,990
61.45 R 4,681,991
82 E 4,681,992
153 SC 4,681,993

CLASS 202

154 4,681,661
270 4,681,662

CLASS 204

9 4,681,664
14.1 4,681,665
15 4,681,666
4,681,667
21 4,681,663
28 4,681,668
35.1 4,681,669
44.4 4,681,670
67 4,681,671
129.4 4,681,672
415 4,681,673

CLASS 206

45.13 4,681,216
141 4,681,217
204 4,681,218
315.11 4,681,219
4,681,220
328 4,681,221
347 4,681,222
354 4,681,223
423 4,681,224
426 4,681,225
449 4,681,226
455 4,681,227
484 4,681,228

CLASS 208

59 4,681,674

CLASS 209

167 4,681,675
380 4,681,676
534 4,681,229
615 4,681,230
656 4,681,231

CLASS 210

88 4,681,677
101 4,681,678
107 4,681,679
110 4,681,680
133 4,681,681
221.2 4,681,682
521 4,681,683
532.2 4,681,684
618 4,681,685
699 4,681,686
764 4,681,687
770 4,681,688
784 4,681,689

CLASS 211

46 4,681,232
70.6 4,681,233
4,681,234

CLASS 213

50 4,681,235

CLASS 215

99.5 4,681,236

CLASS 219

10.51 4,681,995
10.55 M 4,681,996
69 C 4,681,997
99 4,681,998
111 4,681,999
116 4,682,000
121 LC 4,682,001
121 LD 4,682,002
121 LN 4,682,003
121 PC 4,682,004
121 PM 4,682,005
124.34 4,682,006
211 4,682,007
270 4,682,008
377 4,682,009
381 4,682,010
390 4,682,011
490 4,682,012
497 4,682,013

CLASS 220

70 4,681,237
260 4,681,238
408 4,681,239

CLASS 221

48 4,681,240
124 4,681,241

CLASS 222

41 4,681,242
83 4,681,243
144.5 4,681,244
643 4,681,245

CLASS 224

267 4,681,246
322 4,681,247

CLASS 227

73 4,681,248

CLASS 228

37 4,681,249
4,681,250
208 4,681,251

CLASS 229

52 B 4,681,252
92.8 4,681,253

CLASS 235

375 4,682,014
462 4,682,016
472 4,682,015
492 4,682,017

CLASS 236

42 4,681,254
51 4,681,255
56 4,681,256

CLASS 237

4,681,257

CLASS 239

66 4,681,258
206 4,681,259
240 4,681,260
265.19 4,681,261
306 4,681,262
391 4,681,263
589.1 4,681,264
665 4,681,265

CLASS 241

18 4,681,266
23 4,681,267
24 4,681,268
101.2 4,681,269
298 4,681,270

CLASS 242

18 R 4,681,271
47.01 4,681,272
55 4,681,273
58.3 4,681,274
67.1 R 4,681,275
84.1 R 4,681,276
107.3 4,681,279
156.2 4,681,277
195 4,681,278
199 4,681,280
200 4,681,281

CLASS 244

3.16 4,681,282
3.22 4,681,283
102 R 4,681,284
103 R 4,681,285
129.5 4,681,286

CLASS 245

6 4,681,287

CLASS 248

71 4,681,288
224.4 4,681,289
225.31 4,681,290
444.1 4,681,291
584 4,681,292
603 4,681,293
613 4,681,294

CLASS 249

135 4,681,295

CLASS 250

201 4,682,025
211 R 4,682,018
4,682,019
213 VT 4,682,020
4,682,021
214 A 4,682,022
223 B 4,682,023
225 4,682,024
288 4,682,026
291 4,682,027
327.2 4,682,028
330 4,682,029
338 4,682,030
345 4,682,031
352 4,682,032
358.1 4,682,043
363 R 4,682,033
4,682,034
370 4,682,035
374 4,682,036
548 4,682,037
4,682,038
560 4,682,039
571 4,682,040
4,682,041
578 4,682,042

CLASS 251

11 4,681,296
45 4,681,297
129.1 4,681,298

CLASS 252

8.551 4,681,690
12 4,681,691
32.5 4,681,692
49.9 4,681,693
51.5 R 4,681,694
91 4,681,914
94 4,681,695
99 4,681,696
175 4,681,697
182.1 4,681,698
299.1 4,681,699
373 4,681,700
4,681,701
518 4,681,702
522 R 4,681,703
546 4,681,704
631 4,681,705
633 4,681,706

CLASS 254

8 R 4,681,299
131 4,681,300
333 4,681,301

CLASS 256

13.1 4,681,302

CLASS 260

410.9 4,681,708
4,681,709
410.9 R 4,681,707
508 4,681,710

CLASS 261

91 4,681,711

CLASS 264

24 4,681,712
41 4,681,713
46.5 4,681,725
46.6 4,681,714
53 4,681,715
4,681,716
61 4,681,717
102 4,681,718
122 4,681,719
150 4,681,720
169 4,681,721
171 4,681,722
175 4,681,723
257 4,681,724

CLASS 267

8 R 4,681,303
4,681,304
140.1 4,681,306
154 4,681,307

CLASS 269

139 4,681,305
322 4,681,308
328 4,681,309

CLASS 270

53 4,681,310

CLASS 271

11 4,681,311
207 4,681,312
273 4,681,313

CLASS 272

52 4,681,314
122 4,681,315
130 4,681,316
137 4,681,317

CLASS 273

26 R 4,681,318
73 D 4,681,319
109 4,681,320
167 H 4,681,321
173 4,681,322
232 4,681,323
295 4,681,324
345 4,681,325

CLASS 277

27 4,681,326
29 4,681,327
80 4,681,328
167.5 4,681,329

CLASS 280

47.2 4,681,330
47.36 4,681,331
87.02 R 4,681,332
87.04 A 4,681,333
414.1 4,681,334
446 R 4,681,335
482 4,681,336
615 4,681,337
628 4,681,338
633 4,681,339
642 4,681,340
646 4,681,341
690 4,681,342
699 * 4,681,343
751 4,681,344
801 4,681,345
804 4,681,346
4,681,347

CLASS 283

58 4,681,348

CLASS 285

55 4,681,349
315 4,681,350
319 4,681,351
334.1 4,681,352
411 4,681,353

CLASS 290

40 4,682,044

CLASS 292

37 4,681,354
323 4,681,355
327 4,681,356
336.3 4,681,357

CLASS 294

15 4,681,358
81.21 4,681,359

CLASS 296

37.6 4,681,360
37.7 4,681,361
78.1 4,681,362
97 G 4,681,363
217 4,681,364

CLASS 297

85 4,681,365
191 4,681,366
232 4,681,367
250 4,681,368
316 4,681,369
405 4,681,370

CLASS 298

1 A 4,681,371

CLASS 299

8 4,681,372

CLASS 303

106 4,681,373
4,681,374
114 4,681,375

CLASS 305

10 4,681,376
35 EB 4,681,377

CLASS 307

10 AT 4,682,062
125 4,682,045
138 4,682,046
200 B 4,682,047
268 4,682,049
269 4,682,048
270 4,682,050
359 4,682,051
361 4,682,052
425 4,682,053
446 4,682,054
451 4,682,055
456 4,682,056
459 4,682,057
473 4,682,058
496 4,682,059
543 4,682,060
571 4,682,061

CLASS 310

29 4,682,063
61 4,682,064
90 4,682,065
154 4,682,066
156 4,682,067
198 4,682,068
261 4,682,069
334 4,682,070

CLASS 312

108 4,681,378
242 4,681,380
297 4,681,379
333 4,681,381

CLASS 313

43 4,682,071
115 4,682,072
414 4,682,073
444 4,682,074
466 4,682,075

CLASS 315

4 4,682,076
14 4,682,077
86 4,682,078
186 4,682,079
209 R 4,682,080
219 4,682,081
4,682,082
307 4,682,083
4,682,084
371 4,682,085
4,682,086
387 4,682,087

CLASS 318

568 4,682,088
4,682,089
661 4,682,090
685 4,682,091
696 4,682,092
701 4,682,093
723 4,682,094
778 4,682,095
808 4,682,096

CLASS 320

64 4,682,097

CLASS 323

315 4,682,098

CLASS 324

63 4,682,099
117 H 4,682,101
117 R 4,682,100
142 4,682,102
158 MG 4,682,103
208 4,682,104
230 4,682,105
307 4,682,106
4,682,107
309 4,682,108
4,682,109
4,682,110
320 4,682,111
322 4,682,112
441 4,682,113

CLASS 328

67 4,682,114
164 4,682,115
167 4,682,116

CLASS 329

50 4,682,117
122 4,682,118

CLASS 330

149 4,682,119
298 4,682,120

CLASS 331

1 A 4,682,121
2 4,682,122

CLASS 332

16 R 4,682,123
19 4,682,124

CLASS 333

12 4,682,125
81 B 4,682,126
103 4,682,127
139 4,682,128
184 4,682,129
195 4,682,130
202 4,682,131

CLASS 335

14 4,682,132
119 4,682,133
216 4,682,134
256 4,682,135
282 4,682,136
284 4,682,137

CLASS 337

68 4,682,138
186 4,682,139
260 4,682,140
379 4,682,141

CLASS 338

172 4,682,142
307 4,682,143

CLASS 340

48 4,682,144
52 H 4,682,145
77 4,682,146
286 R 4,682,147
311.1 4,682,148
347 DA 4,682,149
347 DD 4,682,150
4,682,152
347 SY 4,682,151
507 4,682,153
572 4,682,154
573 4,682,155
603 4,682,156
605 4,682,157
679 4,682,158
709 4,682,159
729 4,682,160
731 4,682,161
799 4,682,162
805 4,682,163
825.03 4,682,164
825.23 4,682,167
825.5 4,682,165
4,682,166
825.65 4,682,168
928 4,682,170
975 4,682,171

CLASS 342

15 4,682,172
51 4,682,173
160 4,682,174
165 4,682,175
175 4,682,176
176 4,682,177
202 4,682,178

CLASS 343

755 4,682,179
769 4,682,180
789 4,682,181

CLASS 346

1.1 4,682,182
75 4,682,183
140 R 4,682,184
4,682,185
4,682,186
4,682,187
4,682,188
154 4,682,190

CLASS 350

6.6 4,681,394
96.16 4,681,395
96.18 4,681,396
96.20 4,681,397
4,681,398
96.30 4,681,399
96.34 4,681,400
105 4,681,401
286 4,681,402
334 4,681,403
350 S 4,681,404
420 4,681,405
429 4,681,406
471 4,681,407
609 4,681,408
637 4,681,409

CLASS 351

63 4,681,410
137 4,681,411
162 4,681,412
205 4,681,413

CLASS 353

102 4,681,414

CLASS 354

120 4,681,415
173.1 4,681,416
234.1 4,681,417
288 4,681,418
402 4,681,419
409 4,681,420
485 4,681,421

CLASS 355

3 R 4,681,422
3 SH 4,681,428
14 CU 4,681,425
14 R 4,681,423
4,681,424
15 4,681,426
32 4,681,427
73 4,681,429
77 4,681,430

CLASS 356

4 4,681,431
4,681,432
5 4,681,433
45 4,681,434
71 4,681,435
121 4,681,436
129 4,681,437
143 4,681,438
154 4,681,439
218 4,681,440
222 4,681,441
237 4,681,442
246 4,681,443
318 4,681,444
346 4,681,445
350 4,681,446
351 4,681,447
352 4,681,448
364 4,681,449
367 4,681,450
373 4,681,451
375 4,681,452
394 4,681,453
402 4,681,454
445 4,681,455

CLASS 357

23.4 4,682,195
30 4,682,196
36 4,682,197
38 4,682,198
4,682,199
41 4,682,200
42 4,682,201
45 4,682,202
51 4,682,203
4,682,204
53 4,682,205
59 4,682,206
74 4,682,207
81 4,682,208

CLASS 358

19 4,682,209
29 4,682,210
31 4,682,213
41 4,682,211
44 4,682,212
55 4,682,214
75 4,682,215
79 4,682,216
89 4,682,217
93 4,682,218
98 4,682,219
106 4,682,220
107 4,682,221
113 4,682,222
133 4,682,225
148 4,682,226
160 4,682,227
161 4,682,228
166 4,682,229
167 4,682,230
168 4,682,231
172 4,682,232
173 4,682,233
183 4,682,234
212 4,682,235
213.26 4,682,236
224 4,682,240
225 4,682,237
228 4,682,238
241 4,682,239
261 4,682,241
285 4,682,242
287 4,682,243
4,682,244
311 4,682,245
335 4,682,246

CLASS 360

10.2 4,682,247
32 4,682,248
33.1 4,682,249
4,682,250
4,682,251
67 4,682,252
77 4,682,253
103 4,682,254
106 4,682,255
119 4,682,256
128 4,682,257
132 4,682,258
4,682,259
133 4,682,260

CLASS 361

6 4,682,262
31 4,682,263
96 4,682,264
231 4,682,265
235 4,682,266
331 4,682,267
384 4,682,268
386 4,682,269
401 4,682,270
409 4,682,271
437 4,682,272

CLASS 362

18 4,682,273
61 4,682,274
191 4,682,275
294 4,682,276
296 4,682,277

CLASS 363

58 4,682,278

CLASS 364

141 4,682,279
191 4,682,280
200 4,682,281
4,682,282
4,682,283
4,682,284
4,682,285
4,682,286
406 4,682,288
414 4,682,289
4,682,290
4,682,291
424 4,682,292
426 4,682,295
431.05 4,682,293
468 4,682,261
492 4,682,294
518 4,682,296
521 4,682,297
523 4,682,189
557 4,682,298
561 4,682,287
569 4,682,299
571 4,682,300
724 4,682,301
768 4,682,302
788 4,682,303
900 4,682,304
4,682,305

CLASS 365

222 4,682,306

CLASS 366

46 4,681,456
84 4,681,457
149 4,681,458

CLASS 367

21 4,682,307
31 4,682,308
146 4,682,309

CLASS 368

16 4,681,459
21 4,681,460
69 4,681,461
4,681,462
96 4,681,463
157 4,681,464
246 4,681,465
278 4,682,310

CLASS 369

13 4,682,311
32 4,682,312
39 4,682,313
44 4,682,314
45 4,682,315
46 4,682,316
59 4,682,317
4,682,318
75.2 4,682,319
77.1 4,682,320
284 4,682,321
291 4,682,322

CLASS 370

4 4,682,323
85 4,682,324
4,682,325
89 4,682,326
100 4,682,327

CLASS 371

13 4,682,328
15 4,682,329
20 4,682,330
25 4,682,331
38 4,682,332
39 4,682,333
55 4,682,334

CLASS 372

6 4,682,335
10 4,682,336
44 4,682,337
72 4,682,338
95 4,682,339
108 4,682,340

CLASS 373

99 4,682,341

CLASS 374

42 4,681,466

CLASS 375

38 4,682,342
59 4,682,343
62 4,682,344

CLASS 376

171 4,681,726
198 4,681,727
209 4,681,728
247 4,681,729
252 4,681,730
285 4,681,731
337 4,681,732

CLASS 379

1 4,682,345
22 4,682,346
29 4,682,347
37 4,682,348
54 4,682,349
61 4,682,350
62 4,682,351
98 4,682,352
104 4,682,169
163 4,682,353
211 4,682,354
346 4,682,355
347 4,682,356
356 4,682,357
411 4,682,358

CLASS 380

7 4,682,359
10 4,682,360
16 4,682,223
4,682,224

CLASS 381

46 4,682,361
61 4,682,362
74 4,682,363
109 4,682,364

CLASS 382

14 4,682,365

CLASS 383

65 4,682,366

CLASS 400

120 4,681,468
124 4,681,467
157.2 4,681,469
323 4,681,470

CLASS 401

34 4,681,471

CLASS 402

3 4,681,472
15 4,681,473
75 4,681,474

CLASS 403

40 4,681,475
42 4,681,476
298 4,681,477
341 4,681,478

CLASS 404

6 4,681,479
14 4,681,480
34 4,681,481
35 4,681,482

CLASS 405

267 4,681,483

CLASS 406

63 4,681,484

CLASS 407

42 4,681,485
114 4,681,486
4,681,487
4,681,488

CLASS 408

1 R 4,681,489
10 4,681,490

CLASS 409

200 4,681,491
231 4,681,492

CLASS 411

8 4,681,493
54 4,681,494
298 4,681,495
361 4,681,496
377 4,681,497
461 4,681,498
507 4,681,499

CLASS 412

33 4,681,500

CLASS 414

42 4,681,501
121 4,681,502
144 4,681,503
268 4,681,504
744 R 4,681,505
749 4,681,506
786 4,681,507

CLASS 415

116 4,681,508
161 4,681,509
168 4,681,510
211 Re.32,462

CLASS 416

131 4,681,511
132 B 4,681,512

CLASS 417

2 4,681,513
213 4,681,514
218 4,681,515
259 4,681,516
300 4,681,517
395 4,681,518

CLASS 418

152 4,681,519

CLASS 419

8 4,681,733
9 4,681,734

CLASS 420

464 4,681,735
535 4,681,736

CLASS 422

16 4,681,737
28 4,681,738
37 4,681,739
78 4,681,740
100 4,681,741
102 4,681,742
140 4,681,743
173 4,681,744

CLASS 423

239 4,681,746
277 4,681,747
279 4,681,748
326 4,681,749
339 4,681,750
359 4,681,745
584 4,681,751

CLASS 424

10 4,681,753
4,681,754
47 4,681,757
78 4,681,758
80 4,681,759
85 4,681,760
92 4,681,761
4,681,762
95 4,681,763
125 4,681,764
451 4,681,756
453 4,681,752
456 4,681,765
486 4,681,755

CLASS 425

12 4,681,520
36 4,681,521
72 S 4,681,522
168 4,681,523
376 R 4,681,524
527 4,681,525
532 4,681,526
546 4,681,527
562 4,681,528

CLASS 426

5 4,681,766
14 4,681,767
417 4,681,768
540 4,681,769
615 4,681,770
658 4,681,771

CLASS 427

34 4,681,772
38 4,681,773
53.1 4,681,774
64 4,681,775
85 4,681,776
87 4,681,777
96 4,681,778
222 4,681,779
282 4,681,780

CLASS 428

35 4,681,781
36 4,681,782
4,681,783
40 4,681,784
43 4,681,785
44 4,681,786
68 4,681,788
93 4,681,789
96 4,681,790
4,681,791
102 4,681,792
138 4,681,793
188 4,681,794
209 4,681,795
212 4,681,796
4,681,797
215 4,681,798
220 4,681,799
283 4,681,800
4,681,801
288 4,681,802
348 4,681,803
349 4,681,804
391 4,681,805
402.21 4,681,806
403 4,681,807
413 4,681,811
425.5 4,681,808
428 4,681,809
429 4,681,810
432 4,681,812
450 4,681,813
457 4,681,814
458 4,681,815
463 4,681,816
549 4,681,817
577 4,681,787
607 4,681,818
697 4,681,819
698 4,681,820

CLASS 429

121 4,681,821
191 4,681,822
218 4,681,823

CLASS 430

24 4,681,824
57 4,681,825
65 4,681,826
83 4,681,827
97 4,681,828
109 4,681,829
110 4,681,830
114 4,681,831
115 4,681,832
175 4,681,833
270 4,681,834
367 4,681,838
386 4,681,835
434 4,681,836
504 4,681,837

CLASS 431

74 4,681,529
89 4,681,530
181 4,681,531
183 4,681,532
208 4,681,533
290 4,681,534

CLASS 432

48 4,681,535
59 4,681,536
242 4,681,537

CLASS 433

9 4,681,538
73 4,681,539
126 4,681,540
165 4,681,541
172 4,681,542
196 4,681,543
215 4,681,544
224 4,681,545

CLASS 434

99 4,681,546
273 4,681,547
311 4,681,548

CLASS 435

1 4,681,839
6 4,681,840
18 4,681,841
21 4,681,842
41 4,681,843
68 4,681,844
96 4,681,845
108 4,681,852
124 4,681,846
172.3 4,681,847
240 4,681,848
4,681,849
254 4,681,850
262 4,681,851
288 4,681,853

CLASS 436

31 4,681,854
39 4,681,855
78 4,681,857

CLASSIFICATION OF PATENTS

165	4,681,858
501	4,681,859
CLASS 439	
92	4,681,382
135	4,681,383
137	4,681,384
181	4,681,549
252	4,681,385
347	4,681,386
	4,681,387
444	4,681,391
449	4,681,388
557	4,681,389
578	4,681,390
751	4,681,392
851	4,681,393
CLASS 440	
40	4,681,550
CLASS 441	
76	4,681,551
92	4,681,552
CLASS 446	
46	4,681,553
231	4,681,554
327	4,681,555
CLASS 450	
134	4,681,113
CLASS 453	
6	4,681,128
CLASS 455	
17	4,682,367
38	4,682,368
127	4,682,369
166	4,682,370
CLASS 464	
181	4,681,556
CLASS 474	
119	4,681,557
205	4,681,558
CLASS 501	
88	4,681,860
89	4,681,861
108	4,681,862
	4,681,863
CLASS 502	
63	4,681,864
74	4,681,865
154	4,681,866
242	4,681,867
307	4,681,868
349	4,681,869
403	4,681,870
CLASS 503	
200	4,682,191
	4,682,192
209	4,682,193
215	4,682,194
CLASS 514	
15	4,681,871
29	4,681,872
50	4,681,873
90	4,681,874
182	4,681,875
	4,681,876
206	4,681,877
211	4,681,879
212	4,681,883
223	4,681,878
250	4,681,880
256	4,681,884
258	4,681,881
	4,681,882
	4,681,885
259	4,681,886
284	4,681,887
301	4,681,888
307	4,681,889
333	4,681,890
340	4,681,891
378	4,681,892
422	4,681,893
507	4,681,894
535	4,681,895
552	4,681,896
557	4,681,897
602	4,681,899
619	4,681,898
786	4,681,900
CLASS 521	
54	4,681,901
85	4,681,902
167	4,681,903
CLASS 523	
457	4,681,904
CLASS 524	
91	4,681,905
166	4,681,906
180	4,681,907
268	4,681,908
272	4,681,909
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607	4,681,911
827	4,681,912
862	4,681,913
CLASS 525	
148	4,681,915
210	4,681,916
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282	4,681,918
292	4,681,919
328.1	4,681,920
357	4,681,921
474	4,681,922
504	4,681,923
CLASS 526	
125	4,681,924
246	4,681,925
CLASS 528	
48	4,681,926
232	4,681,927
353	4,681,928
493	4,681,929
CLASS 530	
351	4,681,930
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CLASS 534	
575	4,681,932
CLASS 536	
23	4,681,933
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53	4,681,856
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124	4,681,936
CLASS 540	
355	4,681,937
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547	4,681,939
CLASS 544	
370	4,681,947
CLASS 546	
174	4,681,940
302	4,681,941
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340	4,681,944
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CLASS 548	
319	4,681,948
461	4,681,949
CLASS 549	
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CLASS 556	
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428	4,681,961
441	4,681,962
453	4,681,963
CLASS 558	
112	4,681,964
162	4,681,965
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407	4,681,969
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414	4,681,971
CLASS 560	
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126	4,681,976
262	4,681,977
CLASS 562	
413	4,681,978
CLASS 585	
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CLASS 604	
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378	4,681,577
385 A	4,681,580
385 R	4,681,578
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391	4,681,581
890	4,681,582
892	4,681,583
897	4,681,584
CLASS 623	
6	4,681,585
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11	4,681,588
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23	4,681,590

CLASSIFICATION OF DESIGNS

D2—	293	290,900
	314	290,901
	320	290,902
		290,903
	602	290,904
D3—	16	290,905
	25	290,906
	38	290,907
	71	290,908
D4—	115	290,909
	136	290,910
D6—	347	290,911
	367	290,912
	430	290,913
	474	290,914
	477	290,915
	583	290,916
	589	290,917
	603	290,918
D7—	38	290,919
	43	290,920
	47	290,921
	70	290,922
	337	290,923
	391	290,924
D8—	5	290,925
	14	290,926
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	349	290,928
	354	290,929
		290,930
	373	290,931
	499	290,932
D9—	385	290,933
	413	290,934
	434	290,935
D10—	25	290,936
	67	290,937
D11—	3	290,938
	81	290,939
D12—	113	290,940
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	147	290,942
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	215	290,947
	310	290,948
	315	290,949
	317	290,950
	322	290,951
D13—	35	290,952
D14—	33	290,953
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	94	290,959
	102	290,960
	107	290,961
D15—	199	290,962
D16—	45	290,963
	123	290,964
D17—	13	290,965
D18—		290,966
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	23	290,970
D19—	65	290,971
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	92	290,973
D20—	38	290,974
D21—	25	290,975
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		290,977
	82	290,978
	148	290,979
	159	290,980
		290,981
		290,982
	191	290,983
	219	290,984
	234	290,985
D22—	137	290,986
	141	290,987
		290,988
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D23—	1	290,990
	25	290,991
	32	290,992
	35	290,993
	65	290,994
	69	290,995
	136	290,996
	155	290,997
D24—	2	290,998
	8	290,999
	10	291,000
		291,001
	31	291,002
	33	291,003
	56	291,004
	64	291,005
D25—	69	291,006
	74	291,007
		291,008
	75	291,009
D26—	46	291,010
	104	291,012
	138	291,011
D28—	46	291,013
D30—	1	291,014
	33	291,015
D32—	73	291,016
D34—	31	291,017
	46	291,018
D99—	28	291,019

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,680,897
4,680,994
4,681,437
4,681,640
4,681,948
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02 : 4,680,880
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04 : 4,680,815
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4,682,054
4,682,081
4,682,163
4,682,174
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06 : Re.32,461
4,680,813
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4,680,848
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4,681,038
4,681,057
4,681,059
4,681,084
4,681,098
4,681,103
4,681,104
4,681,111
4,681,119
4,681,136
4,681,139
4,681,142
4,681,152
4,681,155
4,681,156
4,681,175
4,681,218
4,681,232
4,681,242
4,681,247
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4,681,255
4,681,259
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4,681,302
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4,681,324
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4,681,378
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4,681,407
4,681,415
4,681,446
4,681,449
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4,682,164

4,682,325
40 : 4,681,165
4,681,169
4,681,266
4,681,675
4,681,758
4,681,854
4,681,866
4,681,869
41 : 4,680,870
4,680,907
4,680,997
4,681,186
4,681,360
4,681,414
4,681,496
4,682,304
42 : 4,680,869
4,680,903
4,680,905
4,680,957
4,680,978
4,680,995
4,681,091
4,681,102
4,681,289
4,681,295
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4,681,303
4,681,314
4,681,382
4,681,402
4,681,511
4,681,534
4,681,577
4,681,600
4,681,625
4,681,629
4,681,658
4,681,691
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4,681,731
4,681,737
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4,681,779
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4,681,814
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4,681,867
4,681,899
4,681,911
4,681,924
4,681,940
4,681,964
4,681,986
4,682,021
4,682,046
4,682,168
44 : 4,681,571
45 : 4,681,042
4,681,060
4,681,723
46 : 4,681,597
47 : 4,681,128
4,681,224
4,681,332
4,681,598
4,682,234
48 : 4,680,930
4,681,037
4,681,101
4,681,140
4,681,145
4,681,159
4,681,160

4,681,161
4,681,163
4,681,164
4,681,166
4,681,167
4,681,168
4,681,193
4,681,195
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4,682,235
4,682,238
4,682,302
4,682,308
4,682,369
4,682,370
49 : 4,681,318
4,681,782
50 : 4,681,221
51 : 4,680,831
4,680,860
4,680,879
4,681,124
4,681,257
4,681,372
4,681,539
4,681,581
4,681,738
4,681,818
4,682,328
4,682,330
4,682,367
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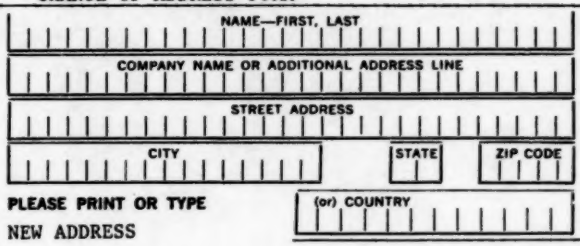

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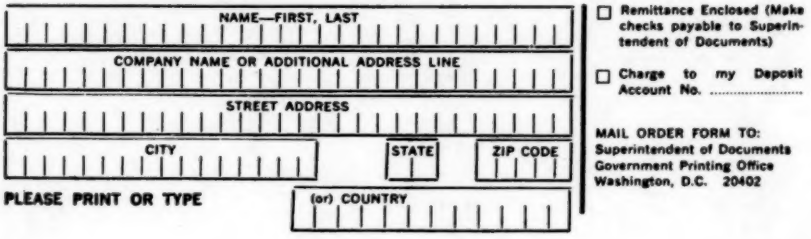

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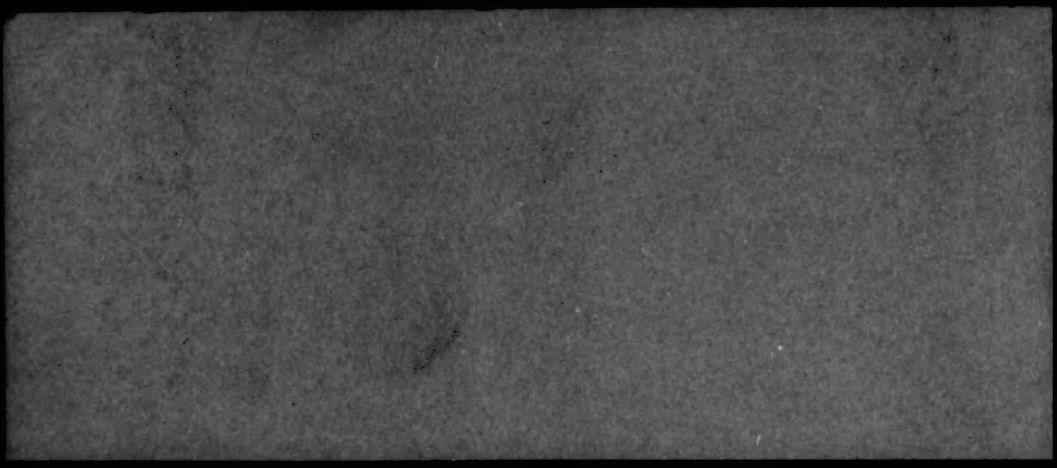

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